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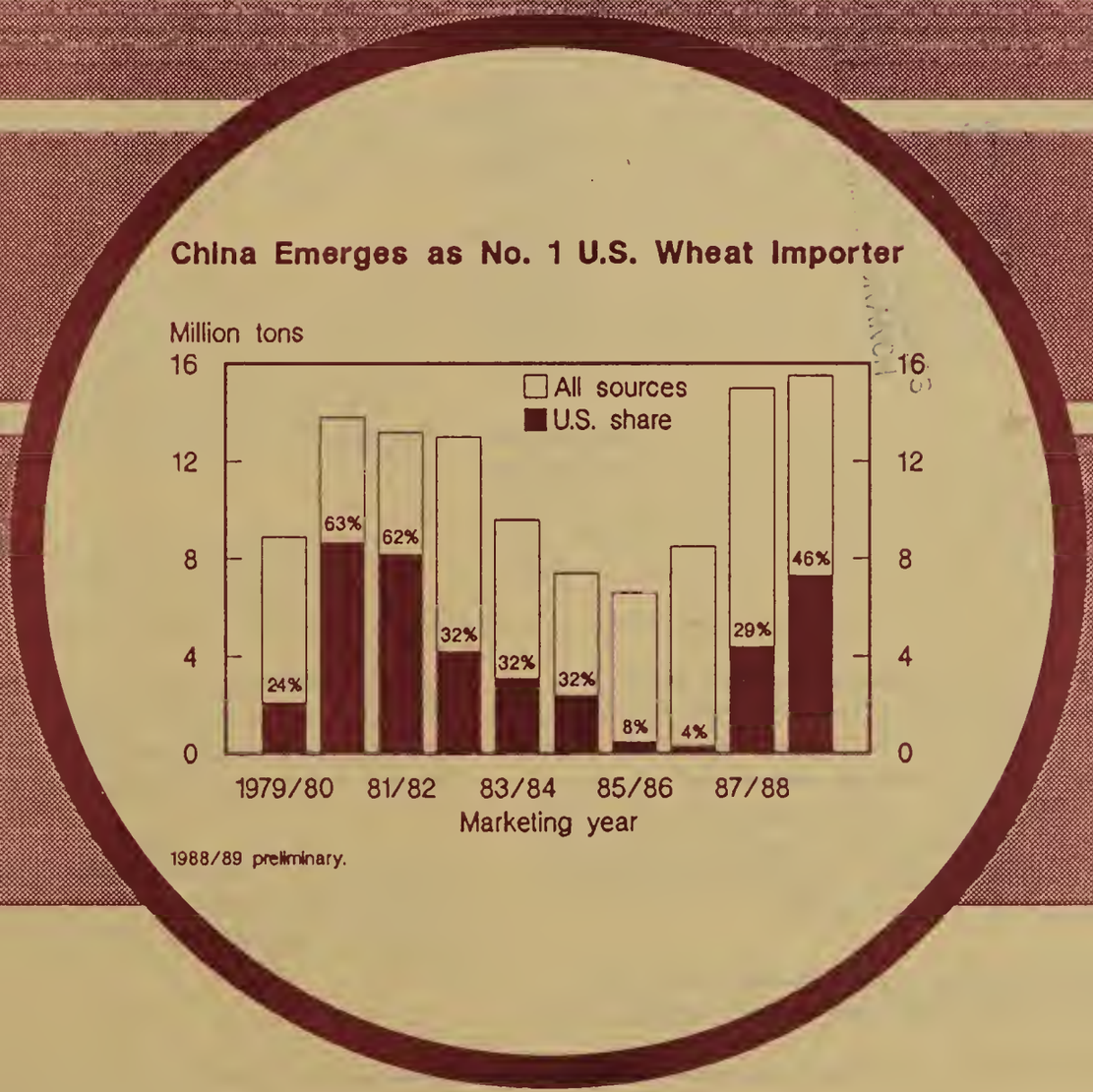

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Summary

China emerged as the biggest importer of U.S. wheat in marketing year 1988/89, despite its frequent position as one of the world's largest wheat producers. The increase in price and volume of U.S. wheat exports helped raise U.S. agricultural exports to China to $759 million in calendar 1988, slightly more than double the 1987 figure. Wheat is currently in great demand as a preferred food grain. Due to population growth and income increases, China will remain a major wheat importer through the end of the century.

Despite the political turmoil in China's major cities this spring, agricultural production has been virtually unaffected. However, China's agricultural trade, particularly imports, will grow more slowly because of the lower availability of foreign exchange resulting from a slower rate of foreign investment and less tourism earnings following the unrest. Nevertheless, China's wheat imports will remain high to avoid unrest among urban consumers.

China's grain production totalled 394 million tons in 1988, down 2.2 percent from 1987. It was the fourth consecutive year in which China failed to achieve the annual output target of 410 million tons. In 1989, China's farmers are expected to increase grain area and yields from a year earlier. The 1989 total grain output will likely surpass last year's after a record summer harvest and increased early rice production. Total grain output in 1989 likely will range between 399 and 409 million tons because of a late summer drought.

Cotton and oilseed output decreased in 1988 after improvement in yields of both crop categories in 1987. Cotton production this year may increase slightly even though area sown declined. Area sown to oilseeds climbed in 1989, but total output may not rise because of drought damage. The 1989 winter rapeseed output reportedly increased 10 percent over the previous year.

Livestock products resumed growth in spring 1988 because China's Government allocated plenty of feedgrains to major hog-producing areas. Production of pork and ruminant meat increased to a record 21.94 million tons, with pork output of 20.15 million. The 1989 production targets call for only a slight increase in red meat output. China's farmers are being asked by authorities to raise more poultry, eggs, fish, and dairy products because these items represent more efficient feed conversion than red meat. The change basically reflects the slowdown in grain production and slow-growing feed supplies expected to persist to the year 2000.

Aquatic production continued its steady and rapid expansion, reaching 10.46 million tons in 1988. The 1989 production is expected to grow at a similar pace, with cultivation of freshwater products again expanding faster than marine products. Other crops, such as fruit and sugar cane, are also expected to increase because of better weather thus far. However, sugarbeet area is down this year, particularly in Heilongjiang, and production of beets will consequently decline.

After 4 consecutive years of below-average grain production, Government leaders continue to search for policies to revive grain output. In November 1988, the Government decided to again raise grain procurement prices, increase central and provincial agricultural investment, and impose taxes on high-value products, such as fruit, aquatic, and timber products, to encourage farmers to produce more grain. At the same time, the Government recentralized fertilizer supply and encouraged reclamation of waste land to boost total grain output. Nevertheless, raising grain prices will push Government price subsidies to an even higher level. The price subsidies for grain, cotton, and oilseeds have totalled more than 20 billion yuan a year in recent years.

China's Government intervenes heavily in the production and distribution of major agricultural commodities. The recently estimated producer subsidy and consumer subsidy equivalents indicate that most agricultural commodities, particularly rice and peanuts, continue to be taxed in China.

Macroeconomy

Economic Growth and Inflation Escalated in 1988

China's economy grew rapidly in calendar 1988 as real gross national product (GNP) expanded by 11.2 percent, slightly below the 12 percent recorded in 1984 and 1985. The gross value of industrial output rose by 20.7 percent, while that of agricultural output increased by 3.2 percent. Light industry developed quickly in 1988, its total value rising 22.6 percent over the previous year. Heavy industrial production also grew a comparable 18.8 percent over 1987. Last year village and township rural enterprises generated over 16 percent of industrial output compared with 10 percent in 1985.

The value of total economic output in rural areas reached 1,207.8 billion yuan (U.S. $1 equals 3.72 yuan), a 12.9-percent increase over 1987. Rural nonagricultural economic activity continued to grow rapidly, so that the cumulative value of rural industry, construction, transport, and commerce increased by 22.5 percent for the year. The share of these economic activities in the total value of rural economic output increased from 50.4 percent in 1987 to 53.5 percent in 1988. In contrast, the share of farm output decreased from 49.6 to 46.5 percent. The 1988 gross value of agricultural output data by subsectors shows that the livestock, fisheries, and sideline (village handicrafts or processing) subsectors are growing the fastest (table 1).

Inflation was a major problem in 1988 as the supply of currency in circulation surged by 47 percent. Despite acknowledged difficulties calculating inflation rates during a period of rapid price increases, the State Statistical Bureau indicated that the general retail price level rose by 18.5 percent over 1987. Price increases escalated toward the end of 1988, with retail prices rising 26.7 percent in December compared with the corresponding period in 1987.

Retail prices went up about 21.3 percent over the previous year in urban areas, compared with 17.1 percent in the countryside. For the country as a whole, prices of foodstuffs rose 23 percent; grain, 14.1 percent; meat, poultry, and eggs, 36.8 percent each; fresh vegetables, 31.7 percent; and aquatic products, 31.1 percent. The cost of clothing went up by 12.7 percent; fuel, 16.1 percent; and agricultural production, 16.2 percent.

Table 1--Index of China's agricultural output, 1984-88

Item	1984	1985	1986	1987	1988
			1978=100		
Total	156.4	161.8	167.3	177.0	182.6
Crops	148.2	145.3	146.6	154.4	153.7
Livestock	173.2	203.0	214.2	221.1	244.1
Forestry	168.5	176.1	169.8	169.3	176.0
Fisheries	155.8	185.1	223.1	263.5	294.5
Sidelines	229.9	277.3	332.6	383.8	423.6

Source: A Statistical Survey of China, 1989, p. 23.

Average urban per capita expenditures rose to 1,119 yuan per year, a 22.2-percent increase; but when adjusted for inflation, the real rate of increase was only 1.2 percent. The average annual per capita net income of rural residents reached 545 yuan, up 17.7 percent (6.3 percent when adjusted for inflation).

China's population grew by 15.41 million in 1988 to 1.096 billion by yearend. The natural increase rate fell slightly, to 14.20 per 1,000 persons from 14.39 in 1987.

Foreign Trade Deficit Expanded

Foreign trade expanded rapidly in 1988, with total trade value reaching $102.79 billion, a 24.4-percent increase over 1987. Exports totalled $47.54 billion, up 20.6 percent; imports amounted to $55.25 billion, up 27.9 percent. The trade deficit worsened, up about $2 billion over 1987. However, more than 31 million tourists visited China in 1988, bringing in over $2.2 billion. Foreign exchange reserves continue to be adequate to finance trade (table 2).

Table 2--China's foreign trade indicators

Items	1986	1987	1988
		US $ million	
Exports 1/:			
Total	30,942	39,437	47,540
Agriculture	5,978	6,458	7,531
Share (%)	19.1	16.4	15.8
Imports:			
Total	42,904	43,216	55,251
Agriculture	2,734	3,969	5,614
Share (%)	6.3	9.2	10.2
Balance:			
Total	(11,962)	(3,779)	(7,711)
Agriculture	3,365	2,489	1,917
Foreign exchange reserves	10,514	15,236	17,548
		Yuan per dollar	
Exchange rate, avg.	3.4528	3.7221	3.7221

1/ All trade data are on an f.o.b. calendar year basis. 2/ Numbers in parentheses are negative.

Source: General Administration of Customs, China's Customs Statistics, various issues; International Monetary Fund, International Financial Statistics, June, 1989, pp. 170.

In 1988, the nation's nontrade foreign exchange income continued to increase, reaching $6.61 billion dollars, up 22 percent from the previous year; non-trade expenditures, at $2.7 billion, rose 31.8 percent. Income exceeded expenditures by $3.91 billion.

U.S.-China trade expanded 38.3 percent to $13.4 billion in 1988. U.S. exports to that nation grew by $1.5 billion but its imports rose by $2.2 billion, increasing the U.S. trade deficit with China from $2.8 billion to $3.4 billion.

At a value of $697.8 million (6.6 million tons), wheat led U.S. exports to China during fiscal year (FY) 1988. This boost in shipments, from $139.2 million (1.9 million tons) in FY 1987, can be attributed to China's increasing population, rising income, and poor grain output during the past 4 years, especially the 1988 shortfall. The Export Enhancement Program (EEP) also made U.S. wheat prices competitive and enlarged the U.S. share of China's wheat imports.

China's wheat demand will continue to be high because of population growth and income increases. Total imports of wheat from all sources will likely be determined by the current year's wheat output and (probably more importantly) by the availability of hard currency.

This year, fighting inflation and slowing industrial growth will be the country's primary tasks. The turmoil, which lasted for about 2 months between April and June, will affect economic growth and trade expansion: both are expected to grow much more slowly than in previous years. China's tourist industry earnings, which declined for the first 6 months in 1989, are expected to plummet in the last half of the year. *[Francis C. Tuan, (202) 786-1626]*

Rural Income Gap Widens In China's Provinces

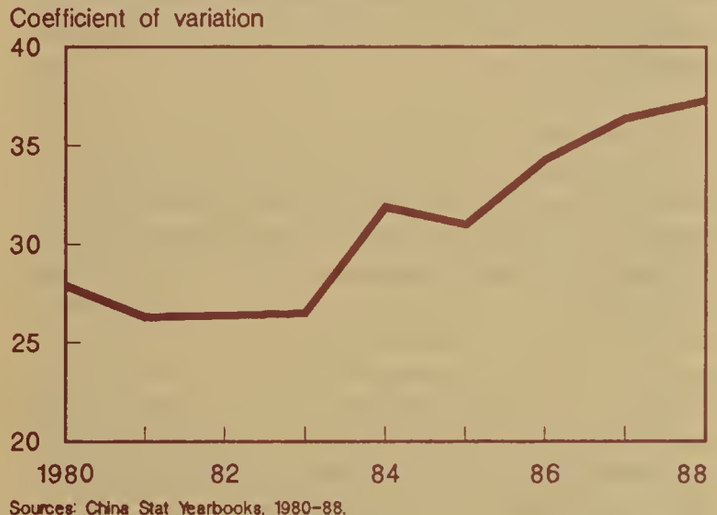
Rural income and expenditure surveys conducted in China over the last decade have generated per capita net income data for agricultural families in most provinces. From 1978 to 1988, the average per capita net income among agricultural families soared from 134 to 545 yuan in nominal terms.

With provincial per capita net income data now available, it is possible to examine the spread of incomes around the mean for each year. Standard deviations were calculated for each year from data in various issues of *China Statistical Yearbooks*, and coefficients of variation for each year were calculated by dividing the standard deviation by the national average income for the year (fig. 1).

The gap between rich and poor provinces narrowed from a coefficient of 35 percent in 1978 to 26 percent in the 1981-83 period. During the same time period, procurement prices were raised, structural adjustments were made, efficiency gains were easier to obtain, and, although incomes rose rapidly, the gap between richer and poorer provinces began to close.

The coefficient of variation rose from 26 percent in 1983 to 37 percent in 1988. The gap may have widened in recent years because some provinces and municipalities, like Shanghai, Beijing, Tianjin, Zhejiang, Guangdong, and Jiangsu, were in a better position to take advantage of the new economic environment than were other provinces: managers were better trained; infrastructure had been improved; major domestic markets were closer; and linkages to foreign markets were strengthened. *[Frederick W. Crook, (202) 786-1626]*

Figure 1
Income Gap Widens In Provinces



Sources: China Stat Yearbooks, 1980-88.

The Impact of the Spring Turmoil on China's Agricultural Production and Trade

Despite the political demonstrations in China's major cities in spring 1989, the declaration of martial law in Beijing, the clearing of Tiananmen Square, and the subsequent political turmoil within the top echelon of China's Government, agricultural production and trade continued virtually unaffected. The turmoil could have a greater effect on production and trade in the remainder of 1989 and beyond. For purposes of analysis, it is useful to try to separate the rural economic conditions that prevailed before the student demonstrations from actions the Government took in June and July 1989 that could affect the agricultural economy.

By fall 1988 China's economy was growing very rapidly, and the rate of inflation exceeded 20 percent. The rapid growth began to be constrained by deficiencies in the energy, material supply, and transportation sectors of the economy. The swift expansion of capital construction projects led to credit shortages. Distortions in the price system prompted the Government to pick up the tab for an increasing number of subsidies, a policy that greatly increased Government debt. Foreign trade surged, with imports outstripping export earnings and boosting the trade deficit. Also, by fall 1988 it was fairly clear that total grain production would again fall short of the 407-million-ton record set in 1984.

In September China's leaders responded to these conditions by introducing austerity measures to control inflation after the Third Plenum of the Communist Party of China's 13th Central Committee meeting. They decided to forego price reforms, and re-instituted some central price control measures. They limited credit and spending on capital construction projects.

At the Rural Work Conference held in November, authorities faced a difficult situation—general economic activity needed to be curbed, but agricultural activity had to be boosted. They earmarked funds to expand agricultural production, but trimmed the funds available to Government purchasing agencies for buying farm products. Without funds, cadres in Government purchase stations used IOU's rather than cash to buy grain, cotton, oilseeds, and other products from farmers. Farmers were irate because they had fulfilled their part of the Government contracts, but the Government had defaulted in its payments. There have been scattered reports of violence in rural China as farmers tried to withhold commodities from purchase agents and tax collectors.

During the fall and winter of 1988, the Government issued regulations to limit the supply of diesel fuel, chemical fertilizer, and plastic sheeting to the Government-owned or controlled supply system; it also forbade open market trading in these items. The Government also signed grain/oilseed and cotton purchase contracts with farmers early in 1989. Farmers again promised to deliver and sell the prescribed goods to Government purchase stations, and the Government agreed to make available specified quantities of diesel fuel, chemical fertilizers, and plastic sheeting to farmers at below market prices.

As farm commodities came on the market this spring, credit shortages again made it impossible for some cadres to pay cash, so they issued IOU's for the second time. The issuance of IOU's is particularly distressing for agricultural production, because some farmers need the cash to purchase diesel fuel, fertilizer, seed, and equipment to plant their second crop, which will be harvested in the fall. IOU payments also reduce the funds available to the rural population for the purchase of necessary consumer goods.

Initial Impact

As noted earlier, the events in Tiananmen Square had little direct immediate impact on agricultural production; the clearing of the square and student demonstrations in other cities were urban rather than rural phenomena. Crops were not burned, trampled, or destroyed by demonstrators or military units; goods involved in international trade were not damaged at ports.

Impact During the Second Half of 1989

On the whole, the turmoil will only slightly decrease rural economic activity. Disruption of the transportation system delayed delivery of some agricultural input supplies, just as disruption of the communication system probably has hindered prompt economic decisions. Work slowdowns impeded economic activity.

The estimated decline in economic activity will decrease export goods. Political issues now reign supreme, and cadres from top to bottom in the administrative hierarchy have become so intensely involved in political activities that they have less time to solve economic problems. Administrators at all levels will be more cautious in making decisions. These elements will make it more difficult for China to earn foreign exchange.

Foreign investment funds going into China in the last half of 1989 will slow somewhat. The manner in which China's top leaders crushed the student demonstrations in early June 1989 strained relations between China and many international institutions and foreign countries; therefore exchanges in the last half of 1989 will be less than normal. Many foreign investors have lost a measure of confidence in China's ability to provide a stable investment climate. Many pending investment decisions likely will be put on hold for some months, perhaps years. The World Bank, for example, has refrained from committing new loans for several months after the Tiananmen Square incident.

In 1988 nearly 32 million tourists visited China, and China participated in technical and cultural exchange activities with 168 countries. The clearing of the square by military force in Beijing has shaken tourists' confidence in the present Government, and the number of tourists going to China in the fall busy season dropped substantially.

Reduced exports and foreign investment, combined with decreased tourism in the last half of 1989, likely will cut foreign exchange earnings. This will make it more difficult for China to import the products it needs. But at the same time, it is very important for China's top leaders to supply adequate grain rations to urban areas to maintain consumer satisfaction, for any disruption in these supplies would lead to urban unrest and further demonstrations. Although lower foreign exchange holdings could reduce wheat imports, consumer pressures may induce authorities to maintain 1988 wheat import quantities.

Longer-Term Impact

The turmoil may impair China's ability to tap into the international community's agricultural technology. Some exchanges have already been suspended. Also, some countries may now be more selective in the kinds of exchanges in which they participate with China, and may tie technological exchanges more closely to political reforms. Such a reduction in technology transfer may hinder China's ability to increase yields and cut postharvest losses.

Currently the top leaders seem to favor more central control of the economy and less reliance on market forces. Pushing farmers back into the old commune system would require an enormous amount of time, administrative energy, and expense. The new leaders probably will support the strengthening of economic cooperatives in rural areas.

Moving farm commodities from rural to urban areas probably constitutes the most important rural issue facing the new leadership in the last half of 1989. If the Government uses administrative and coercive power to forcibly extract grains, oilseeds, and cotton from farmers in exchange for IOU's, rural resistance to Government and Party programs could rise and violence could erupt. Although the Government would reduce inflation by paying with IOU's, the political costs would be enormous. If the new leaders pay the farmers in cash, relations between the Party and farmers would improve somewhat; however, this approach would do little to decrease inflationary pressure in rural areas.

In addition, certain countries may reassess granting most favored nation (MFN) status to China, thus rendering its exports more expensive. The turmoil probably has also damaged China's chances for entering the General Agreement on Tariffs and Trade (GATT). Before the turmoil began, China's leaders were making progress toward establishing the foreign trade institutions necessary to satisfy GATT requirements.

Agricultural Trade

With continued industrial development and export of industrial products, the share of farm product exports decreased from 16.4 percent of total exports in calendar 1987 to 15.8 percent in 1988. The share of farm product imports reached 10.1 percent of total value of imports in 1988, up from 1987's 9.2 percent (table 2).

Agricultural Trade Surplus Fell

In 1988, the total value of agricultural exports increased 17 percent over 1987, and the total value of agricultural imports rose 41 percent. As a result, the agricultural trade surplus decreased from $2.5 billion in 1987 to $1.9 billion last year (table 2).

Grain exports continued falling to 4.9 million tons in calendar 1988 from 1987's 5.2 million. However, higher grain prices increased the total value of grain exports slightly to $1.19 billion in 1988 from the previous year's $1.0 billion. In general, the quantity of different farm exports remained fairly stable. The rise in world agricultural prices explains most of the rise in agricultural export value (appendix tables 5 and 6).

The quantity of grain imports slipped to 15.3 million tons in calendar year 1988 from 16.2 million tons in 1987. The higher grain prices increased the value of grain imports from $1.75 to $1.90 billion (appendix tables 7 and 8).

China imported 3.7 million tons of sugar in 1988, about twice the 1987 volume. Raw cotton exports continued to decrease; net cotton exports fell from 749,000 tons in 1987 to 433,000 tons in 1988. Cotton imports continued to rise.

In 1988, China's foreign exchange reserves continued increasing to $17.5 billion. However, as noted earlier, the decrease in exports, foreign investment, and tourist trade likely will restrain China's ability to earn foreign exchange in 1989.

U.S. Exports Continued To Increase

U.S. agricultural exports to China continued to increase in 1988, their total value rising from $362 million in calendar year 1987 to $759 million in 1988 (109 percent). The increase in price and volume of U.S. wheat exports more than offset the decrease in corn and soybean exports, which fell from 1.5 million tons in 1987 to zero in 1988. U.S. wheat exports soared from 1.9 million tons in 1987 to 6.6 million tons in 1988, and their value jumped from $139 million to $698 million.

Most of 1988 U.S. wheat exports to China were sold and delivered under the Export Enhancement Program (EEP). In calendar 1987, 4 million tons of wheat were offered under the EEP for China, and a total of 3.7 million were sold at bonuses ranging from $30.56 to $44.63 per ton.

In 1988, 7.2 million tons of wheat were offered to China, and 6.49 million were sold at bonuses ranging between $9.84 and $46.07 per ton. Two million tons of wheat were offered to China under the EEP in 1989. Bonuses averaged $17.52 per ton. As of October, 10,000 tons of wheat were still available for China to purchase. *[Shwu-Eng H. Webb, (202) 786-1626]*

Agricultural Policies and Plans

China's main agricultural policies of 1988 were designed to partially relax controls on commodity prices and to increase grain output by: maintaining planted area; raising some procurement prices; encouraging input use; and reclaiming more land. Shanghai, Beijing, Tianjin, Guangzhou, and other large cities began reducing controls on prices of such commodities as grain, meat, eggs, and sugar, in early 1988. However, rising inflation checked price increases for agricultural products by midyear. Unfavorable weather conditions, particularly in the south, reduced grain production 2.2 percent from the previous year to 394 million tons, far below the 410-million-ton target.

Four consecutive years (1985-88) of below-average grain production forced reform leaders to continue searching for policies to revive grain output. Those opposed to the reforms criticized reform leaders for failing to increase grain output and for causing feedgrain shortages, higher grain imports, and rising inflation.

In November 1988, the Government decided to again raise grain and cotton procurement prices. To encourage farmers to produce more grain, oilseed crops, and cotton, it imposed taxes of up to 30 percent on fruit, aquatic, timber, and other high-value products. The Government will also increase the supply of low-fixed-priced fertilizer, encourage reclamation of waste land, and expand central and local government investment in agriculture.

This year's economic plans call for a 4-percent gain in the value of agricultural production, compared with 3.2 percent the previous year. Specific 1989 goals include a grain output target of 410 million tons, a cotton crop of 4.5 million tons, a total oilseed crop of 16 million tons, sugar crops of 65 million tons, red meat products of 23.4 million tons, and aquatic products of 11 million tons. The quantity of grain that the State plans to purchase at fixed prices in 1989 remains at 50 million tons.

Specific changes in procurement prices and new tax rates are described below:

- The State purchase price for grain will increase an average of 18 percent over 1988, but price hikes for individual grains vary. For example, Sichuan province raised the purchase prices for rice, wheat, and corn by 27.5, 7, and 4.7 percent, respectively, over those of 1988.

- Although the Government made no announcements regarding higher State procurement prices for oilseed crops, provincial governments may have instituted some increases. Soybean procurement prices remain the same as last year, but the Government increased fertilizer subsidies for soybean production.

- The State Council announced it would raise its procurement price for cotton for 1989/90 by about 20 percent, from 3.53 to 4.73 yuan per kilogram (including the 0.5-yuan subsidy paid by textile mills and provincial governments). In 1989, local governments are forbidden to provide additional subsidies.

- The Government decided to impose taxes of up to 30 percent on all farmers cultivating fruit, aquatic products, and timber in 1989 to induce them to increase grain cultivation. These new taxes will be uniform across the country. General aquatic products and certain fruits (such as melons) will be taxed at 10 percent. Some specified aquatic products, oranges, apples, bananas, and lychee will be taxed at 15 percent. Timber will be taxed at 8 percent.

- The amount of bonus (low-fixed-price) fertilizer offered for sale to farmers who deliver contracted grains increased this year. The amount of fertilizer rose from 3 to 7.5 kg for every 50 kg of rice and soybeans sold to the Government. For wheat and corn, 5 kg instead of 3 kg of fertilizer will be granted for every 50 kg delivered to the State. Provinces may add more bonus fertilizer if supplies are available.

The State Council adjusted the purchasing and marketing system to control the tight supply and rapid price increases of input materials. The adjustments involved scrapping the multi-channel marketing and distribution of input materials and re-instituting the old monopoly supply system. This change may temporarily reduce the chaotic conditions in marketing and distributing inputs farmers have experienced during the last couple of years. Therefore, supplies of fertilizer and plastic sheets may improve somewhat this year.

The Ministry of Commerce issued new regulations on grain purchases and sales at the end of 1988, allowing provincial grain departments to buy or sell grain at negotiated prices if they meet their State procurement obligations. Rice bought from farmers at negotiated prices must be redistributed to fulfill the interprovince grain transfers mandated by the State plan. The rest of the rice purchased can then be sold directly to provincial grain departments or sold at trade fairs or wholesale markets. Wheat, corn, and soybeans not included in the State purchase quota contracted with the farmers can be bought and sold through different channels, including local stores, township enterprises, and individuals. Established interprovincial marketing channels can continue trading grain if both sides are grain-dealing units at the provincial level. Marketing channels for wheat, corn, and soybeans are permitted at provincial and prefecture levels.

The total investment in agriculture fell from 5.79 billion yuan in 1979 to 4.2 billion in 1987, according to statistics from the Ministry of Agriculture. In 1988, agricultural investment rose 15 percent. In 1989 the Government increased its agricultural investment by 14 percent to ensure a bumper grain harvest. Also, about 20 percent of the World Bank loans will be invested to stimulate grain production.

These policy adjustments were set to meet 1989 targets, particularly in grain production. Policies to deal with complex long-term problems in farming and grain supply still need more debate, experimentation, and research. Recent political developments have clouded the short-term outlook for further reform.

The turmoil likely will have little direct impact on the current agricultural production. The intermediate- and long-term growth of agriculture could be affected if investment from other countries is limited, technology transfers are delayed, and credit supplies are reduced. *[Francis C. Tuan, (202) 786-1626]*

Inputs

Decreases In Irrigated Area End

During the past decade of reform, China's irrigated land decreased by only 1 percent. Irrigated area fell from about 45 million hectares (ha) in 1978 to 44 million in 1985. But because farmers have expanded irrigated area in the past few years, it increased to 44.5 million ha by the end of 1988.

In the period following the organization of townships and villages, reports from some rural areas suggested that farmers were neglecting irrigation and drainage systems. Although farmer abandonment of high-cost, low-benefit water control systems is understandable, system neglect posed serious problems in some districts. Farmers and rural authorities have acknowledged the importance of maintaining the water control systems since 1985, and the Government has issued regulations governing water use fees.

In 1987 fees of more than 800 million yuan were collected, but these only partially offset the cost of maintaining water control systems. Because they must now pay water use fees, farmers are becoming accustomed to the idea that water is a production cost. They are therefore taking steps to use this scarce resource more efficiently.

Before the initial reform period (1979-83), commune cadres mobilized the rural labor force to construct and repair water control systems during the slack winter period, a custom that was apparently disrupted in the early part of the period. But in recent years cadres have mobilized the rural work force to carry on these vital projects. For example, this past winter a total of 3.5 billion labor days were expended on rural capital construction projects.

When cadres negotiated annual production and purchase contracts with farmers for 1987 and 1988, farmers had to agree to donate a specific amount of labor for capital construction projects. The combination of the collection of water use fees and labor contributions should help to maintain and expand the water control systems.

Turnaround In Farm Mechanization

During the initial reform period (1979-83), the area plowed by tractors fell from 40.7 million to 33.6 million ha. But area plowed by machines increased to 40.6 million ha by 1988. The amount of mechanical power available in the agricultural sector (measured in billions of kilowatts) rose 125 percent from 117.5 billion kilowatts in 1978 to 264.5 billion in 1988 (table 3).

During the entire reform period (1978-88), yearend inventories of grain harvesters (combines) used or owned primarily by State farms grew 84 percent, from nearly 19,000 to 35,000. The number of large- and medium-sized tractors went up 55 percent, from 557,358 to 864,000. Small-sized tractors and hand-guided tractors, used and owned primarily by individual households, rose from 1.4 to 6 million, an increase of over 300 percent. The number of rubber-tired, hand-drawn carts went from 29.6 to 66.3 million. Trucks used in the agricultural sector rose from over 73,000 to more than 590,000. Also, the number of rubber-tired trailers (carts or wagons) jumped from nearly 2.5 million to over 4 million.

Many of these vehicles have a dual purpose in rural areas. During the agricultural season, they are used directly in agricultural production; off-season, they are used for local transport of goods and passengers.

In the past decade the number of small-scale rural stations generating electrical power declined from over 82,000 to almost 52,000. But generating capacity more than doubled

Table 3--China's major manufactured farm inputs

Item	Unit	1984	1985	1986	1987	1988
Yearend stocks:						
Large-medium tractors	1,000 no.	854	852	866	881	870
Hand tractors	"	3,298	3,824	4,526	5,300	5,958
Rural trucks	"	349	430	499	550	591
Machinery production:						
Large-medium tractors	1,000 no.	40	45	34	40	52
Hand tractors	"	689	823	773	1,106	1,316
Rural electric consumption 1/	Mil. kwh	40,720	55,470	57,800	65,900	65,500
Fertilizer output 2/:	1,000 tons	14,602	13,222	13,957	16,722	17,670
Nitrogen	"	12,210	11,438	11,592	13,423	13,664
Phosphate	"	2,360	1,760	2,340	3,259	3,950
Potassium	"	3/ (32)	(24)	(25)	(40)	(61)
Fertilizer applied 2/	1,000 tons	17,7311	7,7601	9,520	20,100	21,420
Chemical pesticides	"	310	211	203	260	194
Plastic sheeting	"	--	--	--	287	337

1/ Not all for agricultural production. 2/ All figures in effective nutrient weight. 3/ Numbers in parenthesis are derived.

Source: Various annual SSB Communiques; China Statistical Yearbook, 1988, p. 346; A Statistical Survey of China, 1989.

from 22.34 billion to 46.38 billion watts. Rural electrical consumption rose 9.6 percent in 1988. Power consumption surged from 25,310 to 72,220 million kilowatthours between 1978 and 1988, an increase of 185 percent. Expanding rural industries have consumed much of the gain in electricity generated in the last few years.

Problems Distributing Chemical Fertilizer

In 1988, application of chemical fertilizer rose 7.1 percent. Domestic production on a gross-weight basis rose from 81 million to 83.7 million tons, up 3.3 percent. Plastic sheeting supplied to farmers totalled 337,000 tons, up 17.5 percent. Commercial departments only supplied 194,000 tons of pesticides in 1988, down for the fifth straight year.

There were serious disruptions in 1988 chemical fertilizer supplies. At that time there were two supply sources—the open market and the Government-managed supply and marketing cooperatives. Market forces drove up fertilizer prices in open markets, while the Government promised to sell fixed quantities of low-priced fertilizers to those farmers who had signed sales contracts to deliver grain, oilseeds, and cotton.

Cadres earned handsome profits by removing low-priced fertilizers from the State system and selling them on the open market; many farmers who had signed sales agreements with the Government were unable to purchase the promised fertilizers because supplies were depleted. In 1989 the Government tried to overcome distribution problems by closing open market sales, thereby forcing sales of all chemical fertilizers, pesticides, and plastic sheeting through its own outlets.

Shifts in Rural Labor Use

The rural labor force rose 28 percent from 313 million in 1978 to 401 million in 1988. In 1978 most of China's total labor force was employed in agricultural production, with about 82 percent of the rural work force engaged in cultivating crops. The reforms encouraged diversified production, so that by 1988, far fewer farmers raised crops, and the number engaged in commerce, construction, and industry, had grown (table 4).

During the reform period farmers left fields to work in swiftly expanding rural industries and on capital construction projects in urban areas. The tightening of credit in late 1988 slowed capital construction projects, and many rural laborers returned home. Tighter credit also restricted the growth of rural industries, and many workers were laid off. In late 1988 many of China's large urban areas, particularly Beijing and Guangzhou, were flooded with rural workers hunting for jobs.

Credit and Money Supply Expanded, Then Contracted

In the first three-quarters of 1988, credit and the money supply grew at annual rates of over 20 percent, stimulating economic activity. Workers' wages and bonuses sharply exceeded those of the previous year, and retail sales accelerated rapidly. The overall retail price index rose 18.5 percent during the year, and urban inflation was even higher.

Interest rates on bank deposits in the first three-quarters ranged from 6 to 8 percent. Consumers living in a city with an inflation rate of 20 percent experienced a negative real

interest rate; this induced widespread panic buying in August and September as consumers pulled deposits out of their bank accounts to purchase tangible goods.

At the Third Plenum of the Communist Party of China's 13th Central Committee, the top leaders decided to curb inflationary pressures in the economy. On September 1, 1988, the range of interest rates increased from 6-8 percent to 7-9 percent, and interest rates on personal accounts were linked to the retail price index. This meant that the real interest rate on personal accounts kept pace with the rate of inflation and was designed to stem the trend of depositors withdrawing bank funds. The central bank also raised its reserve ratio from 12 to 13 percent. Other austerity measures included limiting work on capital construction projects and reducing credit for rural industries.

Rural deposits in 1988 increased 6.9 percent to nearly 67 billion yuan. Rural loans expanded by nearly 19 percent to over 81 billion yuan (table 5). Rural workers thrown out of jobs in late 1988 by tighter credit and constraints on construction crammed into large cities looking for work, only to find that they did not have urban status and therefore could not purchase rationed grain at State-owned retail stores. These people were forced to buy their grain on the open market, and thus contributed to higher grain prices in 1988 and 1989.

Table 4--Structure of the rural labor force

Items	1978	1988
	Percent	
Agriculture	92.6	78.5
Industry	2.7	8.5
Construction	0.7	3.8
Transportation	0.2	1.5
Commerce	0.2	1.6
Other	3.4	6.0

Source: A Statistical Survey of China, 1989, p. 21; Agricultural Yearbook, p. 45.

Table 5--Rural deposits and loans, 1980-88

Year	Deposits	Loans
	Billion yuan	
1980	23.984	17.588
1981	27.840	18.972
1982	32.994	21.245
1983	39.127	23.119
1984	37.243	36.808
1985	49.956	41.663
1986	55.964	57.037
1987	62.630	68.583
1988	66.955	81.421

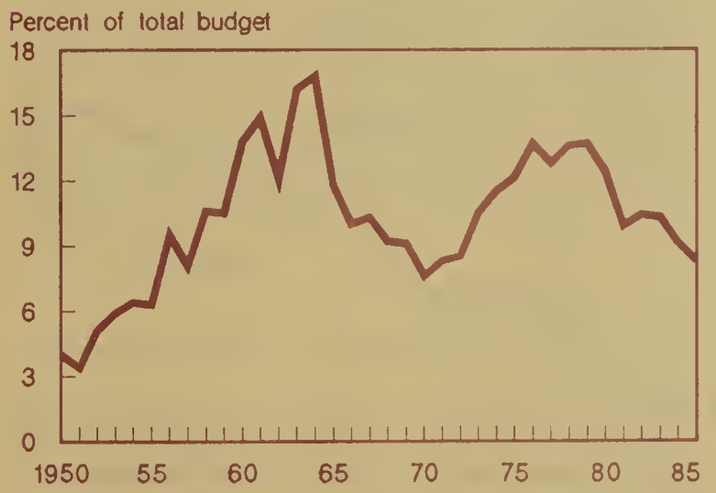
Source: A Statistical Survey of China, 1985-88.

As discussed earlier, the shortage of cash in rural areas in fall 1988 and winter 1989 meant that Government-owned grain stations and Government-managed supply and marketing cooperatives had to issue IOU'S to farmers. In prior years cadres had often given farmers advance cash payments when they signed purchase contracts in the spring, ensuring that farmers had the necessary cash to purchase seed, diesel fuel, electricity, fertilizers, and pesticides to plant crops in fall, winter, and spring. The cash shortages limited these advance payments; they also severely undermined peasant confidence in the Government's commitment to market-based reforms, the household land contract system, and the use of contracts to purchase farm commodities.

The rural financial outlook for 1989 is mixed. Since 1978, the percentage of the Government budget earmarked for the agricultural sector has declined sharply (fig. 2). After the Third Plenum, however, China's top leaders vowed to increase Government investment in agriculture. The Agriculture Bank of China, the country's leading bank specializing in granting loans to farm enterprises, announced in early 1989 that it will increase its loans by 9.2 billion yuan. Rural credit cooperatives also plan to increase their investments by about 8 billion yuan.

As noted earlier, cash shortages persist in rural areas in 1989. In June, the State Council issued a circular calling on local governments to collect cash from all sources to pay farmers delivering farm products to purchase stations, implying that many units are indeed experiencing cash shortages. Newspaper articles in midsummer suggest that cadres lacking cash are turning to administrative means to force farmers to deliver their products. These articles are stridently reminding farmers of their contractual obligations and patriotic duty to deliver grain. *[Frederick W. Crook, (202) 786-1626]*

Figure 2
State Support for Agriculture



Source: China Stat Yearbook, 1987, p.629.

Agricultural Production

Grain

Four Years of Below Par Production

Some analysts in China have viewed the lackluster growth in grain output during 1985-88 as a national crisis. USDA analysis, however, indicates that the grain economy is relatively healthy given current incentive packages. Farmers are beginning to re-allocate scarce resources to maximize profits. They have become more conscious of costs of production and are becoming more efficient—they now use less labor to produce the same amount of grain than in previous years.

Also, over the past 4 years farmers have found they can earn more profit by growing crops other than grain and engaging in different economic activities. These years can be regarded as a transition period in which farmers altered production patterns to fit a new economic order.

Grain production accelerated rapidly between 1977 and 1979. The rate of growth slowed in 1980-81, and then climbed swiftly to a peak of 407 million tons in 1984. Output fell sharply in 1985, and for the past 4 years has not exceeded the record (fig. 3). Grain yields rose rapidly from 1977 to 1984, and leveled off in 1985-88. Nevertheless, 1985-88 yields are relatively high compared with those of 1977.

The area sown to grain crops declined from 1977 to 1988. Per capita grain availability in 1977 was only 298 kg, and the average for 1977-79 was 318 kg. Availability peaked at 392 kg in 1984, and since then has declined. But despite the fact that production has remained below the 1984 record, grain availability for consumers was still greater than in the late 1970's.

Figure 3
Grain Output and Per Capita Availability

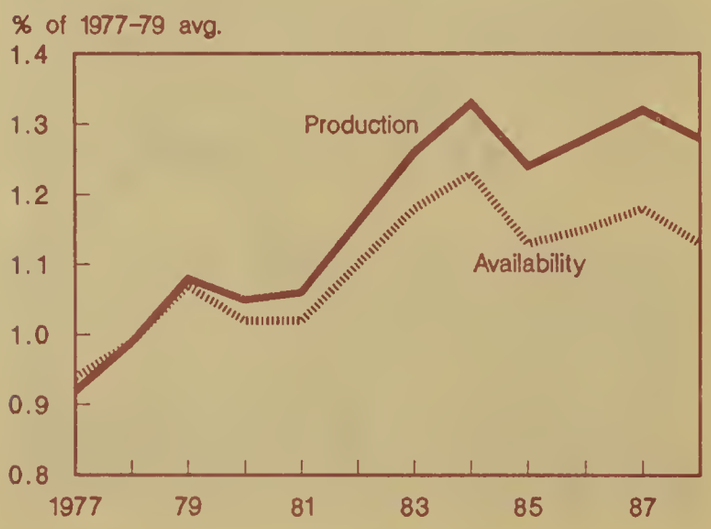


Table 6--Profit margins for selected crops, 1986

Crops	Average yield per hectare (100 kg/ha)	Profit in yuan of product (per 100 kg)	Profit per hectare (yuan/ha)
Wheat	30.40	16.38	498
Rice (milled)	37.40	17.62	659
Corn	37.10	12.72	472
Soybean	14.00	37.26	522
Cotton	8.24	143.22	1,180
Rapeseed	11.96	25.02	452
Peanuts	18.08	39.34	711
Sugarcane	528.66	3.51	1,882
Sugarbeets	159.62	4.44	709

Source: USDA/ERS/ATAD. China agricultural statistics data base, January 1989, and Nongye Nianjian, 1987, pp. 393-394.

The switch from the fulfillment of State-directed output targets to profit maximization was largely responsible for the sluggish growth in grain production during 1985-88. From 1958 to 1984, the commune system organized farmers to complete production targets, and the Government was the primary purchaser of marketed grains. In 1984, the Government re-organized the communes into townships and made contracts with families to farm the land.

The Ministry of Agriculture recently published revenues, costs, and profits for selected crops. The profit margins for these crops give some insight into the kinds of choices grain farmers have been considering in the last 4 years (table 6). For example, some farmers have switched to other crops (such as fruit and tobacco) and other activities (such as commerce and rural industry.)

Farmers began to shift land from grain to other crops in the early 1980's, a trend that has accelerated during the past 4 years. This trend caused an absolute decrease in the area sown to grain from 120 million ha in 1977 to roughly 110 million in 1988.

The rural labor force expanded steadily in the past decade, but the number of rural workers engaged in agricultural production fell. Moreover, the number of farm workers engaged in crop cultivation also decreased. The new system has enabled farm households to allocate their own labor force to specific tasks. Households typically tried to send some family members to work in rural industries that often yielded higher returns than grain crop cultivation. Households could also use their labor to raise crops and animals which yielded better profits than grain.

Electric power consumption in rural areas increased by over 160 percent in the past decade, but a large portion of the gain was not allocated to irrigate and drain grain fields, but instead used in rural industries. Chemical fertilizer use doubled; nongrain crops are estimated to have received an increasing portion of this fertilizer.

Production Down in 1988

Total grain production (wheat, rice, coarse grains, soybeans, potatoes, and pulses) totalled 394 million tons in 1988, down 2.2 percent from 1987. Yields fell 1.4 percent because of dry weather and reduced incentives. Area sown to grain crops declined by 1.4 million ha to 109.8 million.

For the 1988/89 marketing year, China again was a net importer of grain. Imports rose to an estimated 18 million tons, while exports increased to over 6 million tons. Grain available for consumption remained steady because imports and stock drawdowns made up for decreased output. Grain used for feed climbed slightly, while grain used for food decreased. Estimated per capita grain consumption also declined.

At 85.4 million tons, 1988 wheat production was the same as last year. Area sown to winter wheat in fall 1987 increased, but dry, cold weather damaged some fields so that total reported area is estimated to have decreased marginally. Dry spring weather cut winter wheat yields so that outturn was about the same as the previous year. (For a more detailed discussion, see the special article entitled "China's Wheat Economy" in this report.)

Rice output fell to 169.1 million tons of paddy, down 2.7 percent from 1987. Area declined by over 200,000 ha, partly because some paddy fields have been converted to fish ponds and orchards, while others have been built over. In addition, some farmers have switched from rice to more profitable crops. Fertilizer shortages and dry weather in South China reduced yields.

Coarse grain output decreased by an estimated 1.6 million tons to 94 million—down 1.7 percent from 1987. The decline in corn production of over 1.8 million tons accounted for most of the decrease. Area sown to coarse grains dropped an estimated 900,000 ha—corn area alone fell by 500,000 hectares.

Production Likely Up in 1989

For the second year in a row, China's leaders planned for total grain output to reach 410 million tons. USDA estimates indicate that area sown to grain rose about 2 percent over last year to nearly 112 million ha, and yields likely increased. Total grain output is forecast to increase 1 to 4 percent from last year.

Early in 1989 China's leaders made many speeches stressing the need to boost grain production. Although the Government raised its purchase prices for individual grains, USDA estimates that the increases are unlikely to influence farmers' decisions much—in some cases the increases do not even match the current rate of inflation.

In spring 1989 the Government also tried to improve delivery of scarce inputs (such as fertilizer and fuel) to farms, but reports suggest that part of these materials still did not reach them on time. Moreover, once the materials leave the supply points, cadres cannot be certain whether they will be used to increase grain yields, or to produce crops with higher profit margins. Cadres have encouraged farmers to use surplus labor time during the winter season to build roads and water control projects, and farmer involvement in these activities has been higher during winter 1989 than in previous seasons. On the whole the incentive environment to induce farmers to expand grain production closely resembles that of last year.

Wheat output for 1989 is forecast to rise. Area sown to winter wheat is reported to have increased. Government planners pushed spring wheat growers to expand area, so that area sown to wheat is forecast at 29.8 million ha. So far this year, weather has favored wheat production, and yields likely will be up.

Rice output likely will increase because of expanded area and improved yields. The area sown to early rice is reported to be up in 1989—the first time in nearly a decade that early rice area did not decline. Reports of shortages of hybrid rice seed could mean that yields will not increase as rapidly as area; nevertheless, the better weather that has prevailed so far suggests rice yields could rise.

Coarse grain outturn is expected to be lower than last year. Corn shortages in 1988 and early 1989 drove open market prices up, and farmers likely will plant more corn this year to cash in on this crop's improved profitability. But drought conditions in Shandong, Liaoning, Jilin, and Heilongjiang provinces reduced yields. *[Frederick W. Crook, (202) 786-1626]*

Oilseeds

Procurement price increases for rapeseed, sunflowerseed, sesameseed, and oils were not enough to encourage oilseed production in 1988. Area sown to oilseed crops (except cotton and sunflowerseed) declined by 5 percent. Decreased area and the 1988 drought reduced China's oilseed production by 14 percent. The demand for meal and edible oils has increased since the economic reforms began in 1979. The decrease in foreign exchange earnings projected for 1989 will dampen the imports of these items, and the Government will likely adopt tighter procurement policies to cope with the shortage.

Acreage Increased but Output Declined in 1988

China's 1988 oilseed production dropped 14 percent to 13.2 million metric tons from 1987's 15.3 million metric tons (appendix table 3). For peanuts, rapeseed, sesameseed, sun-

flowerseed, and other oilseeds, sown area shrank 5 percent to 10.6 million ha. Soybean area decreased 5 percent, but cottonseed area increased 14 percent. Poor weather throughout the growing season accounted for about 10 percent of the decline in oilseed production. As a result, the production of all oilseed crops (except the more drought-resistant sunflowerseed) fell.

Among oil-bearing crops, cotton was hit hardest by natural disasters. Although the area sown to cotton increased by 14 percent to 5.535 million ha, cottonseed production decreased from 7.2 million to 7.1 million metric tons. Soybean yields decreased slightly in 1988, so output decreased by 6 percent.

Last year's sunflowerseed production bounced back a little to 1.34 million tons, but still fell short of the 1985 peak of 1.73 million tons. The increase in sunflowerseed production was mainly due to expanded acreage.

Area sown to peanuts decreased slightly (about 1 percent) to 2.977 million ha in 1988. Yield declines cut peanut production by 8 percent to 5.693 million tons. Poor weather and a 6-percent decrease in acreage reduced rapeseed production by 24 percent to 5.044 million tons. Sesameseed acreage dropped 8 percent to 0.704 million ha, and production fell 23 percent to 0.404 million tons.

Total oilseed crop output may not increase, although areas sown to oilseed crops have reportedly climbed in 1989 and preliminary reports indicate 1989 winter rapeseed output rose 10 percent. Serious drought, particularly in northeast China and Shandong province, hindered oilseed crop production.

Oilseed and Meal Exports To Fall

The drop in 1988 oilseed production likely will reduce China's oilseed and meal exports for marketing year 1988/89. Peanut exports are projected to slip 30 percent to 250,000 tons, and rapeseed exports likely will plunge by 50 percent to 20,000 tons. Exports of rapeseed meal are projected to fall by 38 percent to 250,000 tons. Exports of soybean meal are also expected to plummet by 19 percent to 1,900,000 tons. Peanut meal exports are forecast to remain at the same level at 100,000 tons.

Despite record oilseed production in 1987 and greater efficiency in the largely State-run crushing facilities, imports of edible vegetable oil increased 121 percent in 1988/89 to 1,313,000 tons. In 1988, the decline in oilseed production should keep up the pressure to import vegetable oil. Given its current foreign exchange constraints, China is expected to increase imports of both palm oil and soybean oil. Palm oil imports are forecast to jump 62 percent to 575,000 tons in 1988/89, while soybean oil imports are forecast to increase by 139 percent to 325,000 tons. *[Shwu-Eng H. Webb, (202) 786-1626]*

Cotton

Cotton output slipped 2.3 percent to 4.149 million metric tons in 1988, despite a 14-percent increase boosting area to 5.535 million ha. The irrational cotton pricing system has greatly contributed to the production shortfall. Cotton yield decreased substantially to its lowest level since 1982, largely due to poor weather. The rising cost of inputs (especially pesticides and plastic sheeting) decreased their use, and this also contributed to yield reduction. On the other hand, the expansion of the textile industry continues to increase cotton demand. As a result, cotton exports are still falling and imports are rising.

Cotton Shortage Reached Crisis Level

With the continuous development of the textile industry and cotton exports, cotton demand is estimated at more than 5 million tons and increasing. Production has fallen short of demand for 4 years in a row. State and commercial stocks are now quite low in some provinces. By April 1989 about 56 percent of the country's provinces and cities failed to meet their targeted goals for cotton delivery to textile mills. Consequently, many mills that are short of cotton have to pay in advance, offering distributors much higher prices. The black market cotton price was nearly 7,000 yuan per ton, roughly twice the 1988/89 procurement price.

State mills are the main users of procured cotton, taking about 3.75 million tons annually. Therefore, State mills are also hit hardest by shortages— especially those in coastal areas, which have no local supplies. Because State mills received less than their allocated amount in 1988/89, they were forced to use up inventory or shut down.

The shortages also eroded quality standards. Firms received lower grade raw cotton than that specified on their contracts; some firms even found sand, talcum powder, and concrete mixed in with the cotton they purchased. The cotton shortage has reduced textile profit. In first-quarter 1989, the textile industry's production climbed 3 percent, but profit fell 13 percent from the corresponding period a year earlier. The cotton shortage also threatens the industry's ability to earn foreign exchange.

Exports Fall While Imports Rise

The shortage cut exports and significantly boosted imports. China's cotton exports decreased from 755,000 tons in calendar 1987 to 468,000 tons in 1988, while its imports rose from 5,976 to 34,773 tons. Due to the 1988 production shortfall, cotton exports in the first 9 months of 1989 fell to 255,000 tons, down from 378,600 a year earlier.

China will likely boost its exports of higher priced and better quality cotton to earn more foreign exchange; it will also likely increase its imports of low quality, inexpensive cotton, which comes largely from the United States.

Procurement Difficulty

The main cause of the production shortfall is the irrational cotton pricing system. The cotton procurement price has remained very low, and because authorities closed the open cotton market, cotton-producing peasants cannot capitalize on higher market prices when a shortage occurs. The procurement price ratio of cotton to grains decreased from 1:9 in 1980 to 1:5.7 in 1988.

The low procurement price, along with rising input costs and the Government's lack of purchasing funds, caused peasants to hold onto cotton stocks in the hopes of receiving higher prices at a later time. Some peasants processed lint into padding cotton and sold it to industrial areas at prices above the procurement price. Incentives to grow cotton for the Government price are minimal. The Government had a very difficult time obtaining cotton in calendar 1988, when its procurement dropped more than 7 percent to 3.78 million tons.

Output To Remain Low in 1989

Cotton production this year may increase slightly even though area sown declined. Yields will grow about 5 percent because of increased use of chemical inputs and dry weather at harvest time. In early 1989, when peasants displayed an unwillingness to plant cotton, it was estimated that cotton area sown would likely decrease by 20 percent for the year. However, the State and provincial governments adopted measures just before planting time to motivate peasants to plant cotton, and China's State Statistical Bureau (SSB) now estimates that sown area will be around 5.36 million ha.

The State Council announced that the procurement price for cotton for 1989/90 will on average be raised 34 percent to 4,728 yuan per ton. In the meantime, the State has eliminated the extra incentives given by the local governments or mills, which amounted to roughly 500 yuan per ton (14 percent) in most provinces. The net increase in this year's cotton procurement price was therefore about 20 percent.

To encourage cotton deliveries this year, the State guaranteed those peasants producing cotton 70 kg of fertilizer and 5 kg of diesel oil at State-fixed low prices for every 100 kg of cotton delivered. Because the State prohibited additional monetary incentives, local provinces tried to increase bonus fertilizers to peasants for cotton procurement and delivery. Most cotton-producing provinces raised their fertilizer bonuses to 100 kg; Liaoning and Sichuan increased their bonuses to 130 and 250 kg, respectively. But despite these incentives, the profit margin for cotton remained less than that for other crops. Area is projected to decrease slightly in 1989.

Given relatively high official prices for fertilizer and the higher prices grains and cash crops can fetch on the open market, some of the fertilizer allocated to cotton production will likely again be diverted to other crops. Recent reports indicate that some cotton area experienced lower temperatures and wet weather at planting. Supplies of much-needed pesticides and plastic sheeting have increased but are still in short supply. The cost of applying them continues to rise sharply, making these materials prohibitively expensive for cotton producers. If weather conditions remain normal and dry for the rest of the harvesting season, cotton production will likely increase only slightly. *[Shwu-Eng H. Webb, (202) 786-1626]*

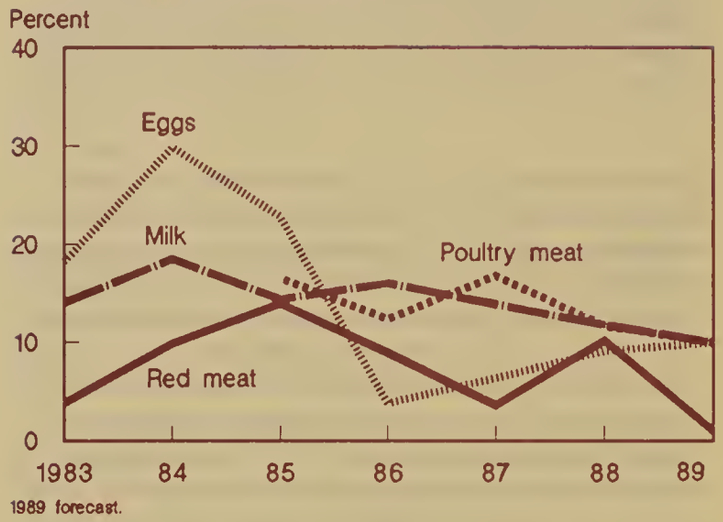
Livestock and Feed

Production of pork, China's predominant meat product, continued increasing in 1988 as it has throughout the last decade, pushing total red meat output to a record 21.94 million tons. Livestock products resumed growth in spring 1988 because the Government allocated plenty of feedgrains to major hog-producing areas after being forced to ration livestock products in large cities at the end of 1987.

Procurement price increases ranging from 30 to 40 percent in early 1988 also prompted farmers to produce more pork. The hog slaughter rate in 1988 rose to almost 84 percent, the highest level in the last 10 years, although still quite low compared with that of the United States. Poultry production continued growing rapidly because of efficient use of feedgrains and rising demand.

China's 1989 production plan targets for livestock products call for only a slight increase (about 200,000 tons) in red meat output; the plan focuses mainly on production of poultry meat, eggs, ruminant meat, and dairy products. Long-term growth of livestock output is expected to be slowed by adjustments in the structure of the livestock sector. The slowdown reflects slower growth in grain production and lower feed supplies per animal unit expected to persist to the year 2000.

Figure 4
Annual Growth Rates of Major Livestock Products



1989 forecast.

Steady Growth In 1988

Livestock production continued to grow steadily in 1988, despite grain production that fell short of the 1984 record by about 13 million tons. Total red meat output, including pork, beef, and mutton, grew over 10 percent to 21.94 million tons (fig. 4 and appendix table 4). Government allocation of feedgrains to major hog-producing areas and a 30-40 percent hike in procurement prices restored farmers' incentives to produce pork. Pork outturn has expanded steadily since reforms were started in the late 1970's, topping 19 million tons last year. The yearend hog inventory number rose 4.4 percent from 1987 to a record 342 million head.

The number of hogs slaughtered also increased by 5.2 percent to 275 million. The annual slaughter rate reached its highest point in the last decade— almost 84 percent, compared with about 62 percent in 1979. This increase in slaughter rates during the reform years reflects more efficient use of feedgrains, better hog breeds, and improved management.

Ruminant meat production, including beef and mutton, continued to rise last year. Despite significant development in percentage growth, China's beef and mutton output levels lagged behind pork production, for each still totalled less than 1 million tons. A huge number of cattle are raised in China, but they are chiefly used for draft purposes. In recent years, the trend toward raising more dairy cattle around big cities has boosted beef output, because young dairy steers are being culled and raised as beef animals.

Production of dairy products, especially cow's milk, continued to expand steadily in 1988, although not as rapidly as in the mid-1980's. Milk output rose to 3.69 million tons, almost 12 percent above the previous year. Dairy cows totalled 2.37 million head, compared with only 558,000 in 1979.

The World Food Program (WFP) helped China to develop its dairy industry from 1984 to 1988. The European Community will institute a similar project to aid dairy industry development over the next several years. As a result, milk output will likely increase in coming years.

Poultry meat and egg production kept growing in 1988. China's economic and agricultural planners have increasingly encouraged farm households to raise more poultry and fewer hogs because of poultry's better feed conversion. In 1988, poultry output reached 2.2 million tons and egg outturn 6.4 million tons; these commodities averaged annual growth rates of 12.5 and 10.4 percent, respectively, in the last 4 years. The Ministry of Agriculture plans to increase poultry consumption from less than 10 to 12 percent of total meat consumption in 5 years.

Wool output rose over 3 consecutive years. Output reached 224,000 tons in 1988, up 7.3 percent from 1987. According to the Ministry of Textile Industry, China is the second largest wool importer in the world, spending more than U.S. $600 million to import 170,000 tons a year. To alleviate the wool shortage, the country is planning to raise sheep in hilly areas in the southern provinces. Government officials indicate that experts have found the south, which used to be thought too hot and humid for sheep, in fact offers several advantages over the north. The grass there is thicker and provides a longer grazing period. The southern areas also have better infrastructure because of their more convenient transportation and proximity to industrial centers and markets.

Expansion To Slow In 1989

Lower grain production in 1988 and the slow growth in grain output over the previous 3 years have caught the attention of China's officials. Feed shortages are forcing them to acknowledge that the goal of increasing meat supplies will have to be adjusted to the availability of feedgrains and improvements in feed efficiency.

Currently, China has set its 1989 meat output target at 23.4 million tons, only 200,000 tons above that of last year. This unusually low target is believed to be the result of feed shortages, rising feed prices, and decreasing inventory numbers of both hogs and chickens reported early this year.

Poultry and egg production should maintain an annual average growth rate of 10 percent. Manufactured feed output will continue to grow and provide more feed for poultry and egg production. Reportedly, processed feed output expanded to about 30 million tons in 1988. Four years ago, the 1990 target for mixed feed output was set at 50 million tons, but it now seems unlikely that China will be able to reach this target.

A Ministry of Agriculture official announced early this year that farmers would no longer be encouraged to increase hog inventory numbers because of limited feed supplies and the hog's lower capability to convert grain into meat than poultry or fish. This will likely prompt farm households to increase production of poultry meat, eggs, and ruminant meat. Pork consumption is expected to fall from 83 to 78 percent of total meat consumption over the next 5 years. *[Francis C. Tuan, (202) 786-1626]*

Other Crops

Sugar crops, tobacco, tea, and aquatic products showed significant production gains in 1988. All of these commodities reached new peaks. Total fruit outturn was about the same as the previous year. Increasing demand for sugar, fruits, and aquatic products, combined with expected income gains, should fuel further production growth. Early information suggests tobacco farmers will expand area again in 1989 (table 7).

Sugar Crop Output Up

Sugar crop production increased sharply in 1988 to 61.87 million tons, mainly because of a 57-percent gain in sugarbeet output. Sugarbeet production reached 12.8 million tons, which not only set a new record but also nearly doubled 1982 output. Unusually wet, cool weather in the northeast during planting benefited beets while retarding competing crops, such as corn and soybeans. Heilongjiang province, the biggest sugarbeet-producing area in China, reportedly purchased 5.5 million tons of beets in 1988.

Sugarcane output increased a moderate 3.6 percent to 49.1 million tons. This output is still about 2.5 million tons lower than the record 51.55 million of 1985 despite greater incentives offered to both farmers and refineries. In late 1987, the Government raised procurement prices for sugar crops a modest 10 percent, their first price change since 1963. In mid-1988, the Government increased ex-factory prices for refined cane sugar to 1,650 yuan per ton for first grade and 1,800 yuan for second grade.

Both beet and cane yields in 1988 are estimated to be slightly higher than the historical average. The increase can be attributed to favorable weather during the growing period and a slowly expanding use of better varieties. However, wet weather in southern China during the summer of 1988 is believed to have harmed the sugar content of the cane, reducing it below the normal range.

Although China's sugar consumption has increased rapidly over the last few years, per capita consumption, estimated at around 7 kg, is low by world standards. As income, population, and the food processing industry grow, demand for sugar will continue to rise. As long as sugar is rationed in most areas in China, demand for this commodity will far exceed the supply. According to the SSB, China's sugar imports skyrocketed in calendar 1988 to 3.7 million tons, more than double the previous year's 1.8 million.

Table 7--China's other agricultural product output

Product	1985	1986	1987	1988
		1,000 tons		
Sugar crops	60,648	58,525	55,504	61,874
Sugarcane	51,549	50,219	47,364	49,064
Sugarbeets	8,919	8,305	8,140	12,810
Sugar	4,513	5,250	5,060	4,550
Tobacco	2,425	1,707	1,943	2,734
Flue-cured	2,075	1,374	1,636	2,337
Tea	432	460	509	545
Jute and hemp	4,119	1,420	1,137	1,078
Silk cocoons	336	336	354	394
Aquatic products	7,052	8,235	9,550	10,610
Rubber	188	210	238	240
Fruit	11,639	13,477	16,678	16,661

Source: A Statistical Survey of China, 1989; Statistical Yearbook, 1989.

In 1989, sugarcane output should keep on growing, partly because procurement prices were raised again in October 1988. In addition, substantial resources have been allocated to improving infrastructure and milling capacity. Lower acreage and drought reduced yields in Heilongjiang province are expected to cut sugarbeet output. Nonetheless, because of continued rising demand, annual imports of 2.5-3.0 million tons of raw sugar are expected for the next several years, assuming China's exchange reserves are adequate.

Tobacco Output Rose Sharply

In 1988, tobacco output soared to a record 2.73 million tons, up about 41 percent over the previous year. The surge in production built up stocks. Recent Government surveys suggest that farmers intend to plant more than 1.5 million ha of flue-cured tobacco in 1989, 18 percent more than in 1988. Farmers remain enthusiastic about tobacco production because it is more profitable than grain. Local tax revenues from cigarette sales has been the main force driving tobacco production growth.

Flue-cured tobacco output, which accounted for 80-85 percent of total outturn in past years, reached a record 2.34 million tons in 1988, up more than 42 percent from the previous year and 12 percent from the former record set in 1985. Although tobacco prices have not increased since 1987, farmers reportedly can earn an average of 5,600 yuan per ha.

The quality of the tobacco crop continues to improve because of the 1987 changes in the grading and pricing system, which rewarded the production of high quality leaf. In 1988, upper grades accounted for 15 percent of the tobacco purchased by the China National Tobacco Company, up 50 percent over 1987, while leaf graded medium quality or better comprised 70 percent of procurement, up 68 percent.

The country's foreign tobacco trade is still dominated by flue-cured imports. China generally imports high quality leaf from Brazil and Zimbabwe. In 1988 China imported 990 tons of U.S. tobacco, valued at $2.57 million. (A Sino-U.S. joint venture operating in the Xiamen Special Economic Zone was most likely the actual importer of this tobacco.) China's imports of U.S. cigarettes were valued at $136 million, a 48-percent increase over 1987.

Tea Production Set a Record

Last year's tea production reached a record 545,000 tons, up 7.3 percent from 1987. The major tea-producing provinces are Zhejiang, Hunan, Sichuan, Anhui, and Fujian. China now has more than 1 million planted ha of tea, 80 percent of which can be harvested.

A growing share of China's tea crop is finding markets abroad. The country is the world's third largest tea exporter, after India and Sri Lanka. Its export income in 1988 was valued at $400 million, making tea China's third largest agricultural export commodity, after grain and silk. Last year China exported 197,000 tons of tea, 20,000 tons more than the previous year and double the amount of 10 years ago. Green tea exports totalled 74,000 tons, and black tea, 100,000 tons.

The United States imported 20,000 tons of tea from China last year, twice the amount of 1987. Other countries importing 20,000 tons or more were Hong Kong, the USSR, and Morocco.

Fruit Output Stagnated

Fruit production in 1988 dropped a marginal 0.1 percent from the previous year because of poor weather. Production totalled 16.66 million tons, reversing an increase spanning 5 consecutive years. However, in 1989, better weather may increase production. The Government has proposed to raise taxes on fruit production to encourage farmers to grow more grain. Farmers producing certain fruits (including melons) will be taxed 10 percent of the proceeds; those growing apples, bananas, and lychee reportedly will be taxed 15 percent.

Aquatic Production Continued To Rise

The output of aquatic products reached a record 10.61 million tons in 1988, up 11.1 percent from a year earlier. The total catch of freshwater products increased by 11.8 percent to 4.55 million tons, and that of marine products rose 10.6 percent to 6.06 million tons.

Because of more efficient use of processed feed, rural cadres are encouraging households to increase aquatic as well as poultry production. In consequence, rapid growth in aquatic and poultry meat output relative to other livestock products can be expected in future years. *[Francis C. Tuan, (202) 786-1626]*

China's Wheat Economy

Frederick W. Crook*

Abstract: China is one of the world's largest wheat producers and at the same time is a major importer. Wheat farmers have succeeded in raising output by increasing yields through greater irrigation and use of better seeds. Wheat is in great demand as a preferred food grain; little is used for feed or for industrial purposes. In the next decade wheat production likely will rise because of improved yields, use of better seed, more fertilizer, and better management practices. But these increases likely will fall short of demand because the population will continue to grow and rising incomes will enable consumers to purchase more wheat products. Imports by the year 2000 will be substantial.

Keywords: Wheat, production, consumption, imports, feed, stocks.

China currently is one of the world's largest wheat producers, with a 3000-year history of wheat cultivation. Although wheat production rose sharply after rural reforms were initiated in 1978, population gains and rising incomes over the last decade have boosted demand over domestic supply, necessitating large wheat imports. U.S. firms have played an active role in that market, and consequently wheat exports from 1978 to 1987 averaged more than 40 percent of annual U.S. agricultural exports to China.

China's population will continue to grow in the next decade, and if per capita income continues to rise, demand for wheat will also increase. However, prospects for rapid gains in domestic wheat output are dim because little arable area can be shifted to wheat production, and yields are already high. The outlook for wheat exports to China therefore looks promising in the near future; the rate of growth depends largely on the ability of the rest of China's economy to earn foreign exchange.

This article examines crucial elements in China's wheat economy. It reviews current wheat production conditions, crop locations, and the potential for yield increases. It identifies the institutions that hold wheat stocks and describes how wheat moves from farm gate to consumer. The article then analyzes China's wheat import market and identifies that market's participants and market shares. Finally, it describes the feed, industrial, and food uses of wheat in China, and summarizes the major trends in China's wheat economy in a supply and use table for 1960-1987.

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Supply of Wheat

Production

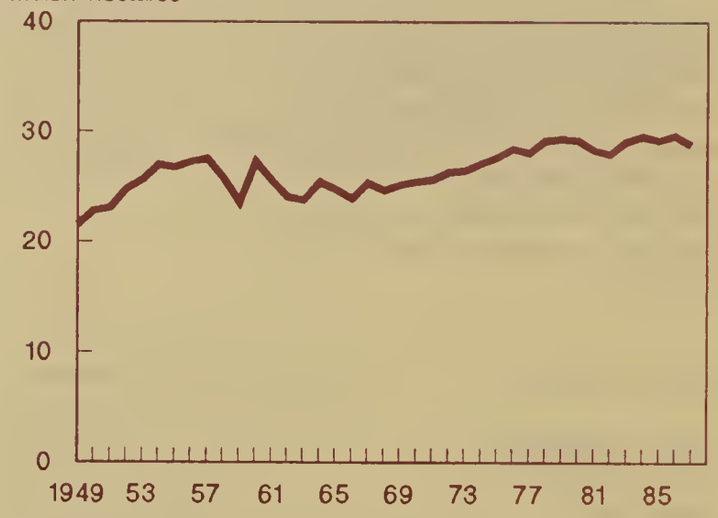
Wheat plays an important role in China's overall grain economy. The crop accounts for nearly 26 percent of the total area sown to grain crops and comprises almost 22 percent of total grain output. The crop is grown in all provinces in three growing regions: the northern winter wheat region accounts for about 60 percent of the total area; the southern winter wheat region comprises about 20 percent of the area; and the spring wheat region has the remaining 20 percent of the area. On an output basis, winter wheat accounts for about 85 percent of total wheat, and spring wheat contributes the remaining 15 percent.

Wheat area expanded rapidly, from 21.5 million hectares (ha) in 1949 to 27.5 million in 1957. Area fell during the Great Leap Forward (1958-61), when communes were organized, the supply of inputs was disrupted, and farm incentives decreased, but rebounded steadily to 29 million ha in 1977. For the past 10 years area sown to wheat has stayed at about this level (figs. A-1 to A-6).

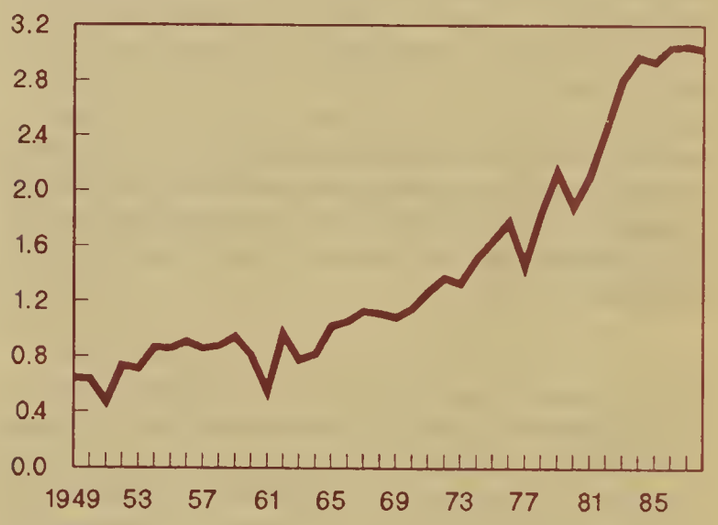
Yield increases have been the driving force behind the rapid jumps in wheat output (fig. A-2). Yields rose from a low of 642 kilograms (kg) per ha in 1949 to 909 kg in 1957, before taking a plunge during the Great Leap Forward. Yields climbed steadily from the mid-1960's to 1987. The reasons for the steady rise in yields are unclear, but certainly expanding irrigated area in the North China Plain was a major factor; in addition, increased use of chemical fertilizers, improved seeds, and better management practices all helped to boost yields, particularly in the early 1980's.

Wheat

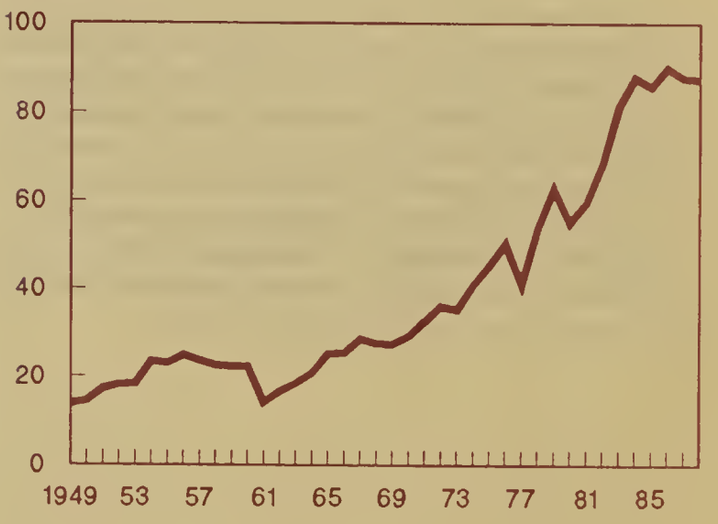
A-1
Area
Million hectares



A-2
Yields
Metric tons/ha

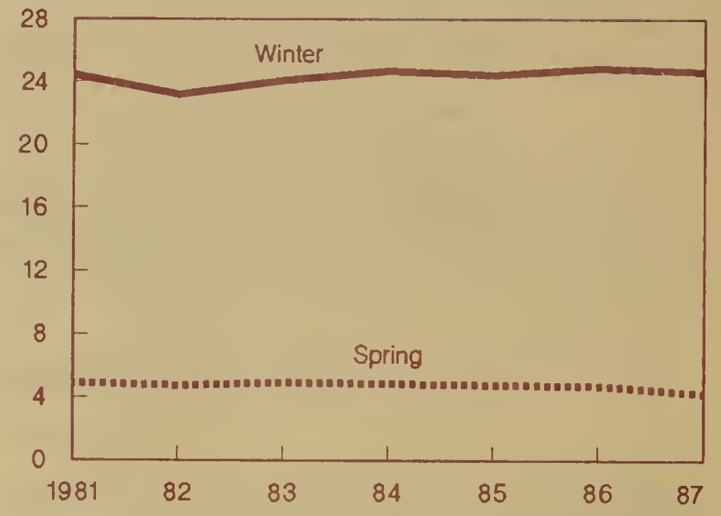


A-3
Production
Million tons

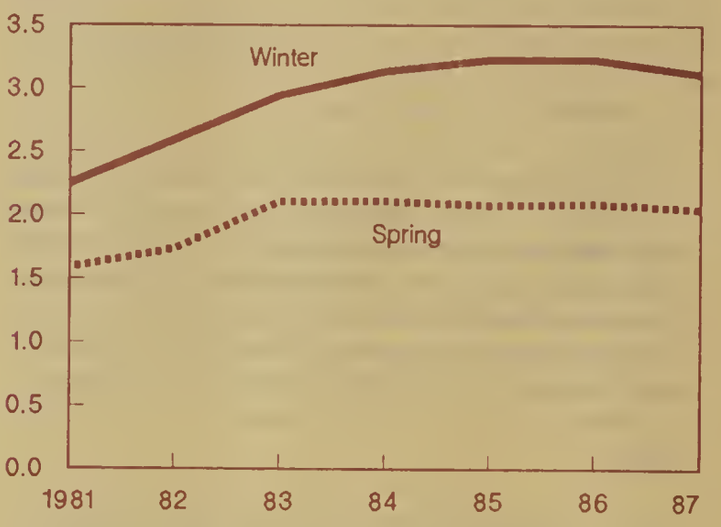


Winter and Spring Wheat

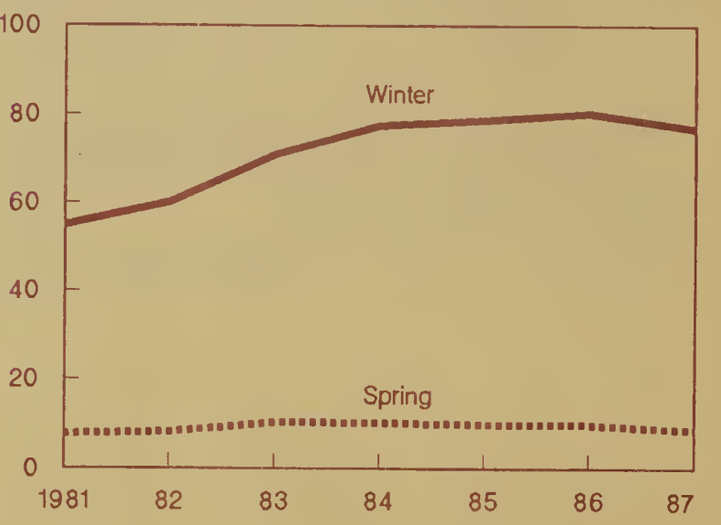
A-4
Area
Million hectares



A-5
Yields
Metric tons/ha



A-6
Production
Million tons



China's agronomists claim that 80 to 85 percent of the crop is irrigated (15, p. 3). Certainly farmers have invested heavily in building irrigation and drainage systems in the past 30 years. In the space of 20 years (1965 to 1985), irrigated area expanded from just over 33 million ha to 40 million, an increase of about 21 percent (5, p. 39). While the overall expansion of irrigated area has been impressive, the digging of tube wells on the North China Plain, the major winter wheat producing region, has probably also boosted wheat yields significantly (15, p. 3). An important factor in continued growth is the capacity of the aquifer to maintain a reliable supply of water. Recent reports indicate that the water table has been falling.

There is little data on the sources of nutrients for wheat plants. Sample survey data suggest that fertilizer accounts for a little over 20 percent of the cost of producing wheat (fig. A-7). Farmers traditionally apply large amounts of organic fertilizer to wheat fields (15, p. 7), and certainly this source supplies a large portion of required nutrients. Some chemical fertilizer is applied, but there is little data on quantities per unit area. When provincial officials in northern China were asked how farmers allocated their supplies of chemical fertilizers, they replied that corn fields received the most, followed by rice, and stated that "wheat fields do not get very much" (9, p. 16).

China's farmers have had many wheat varieties to plant. They had original wheat varieties, and more were introduced in the 19th and 20th centuries. Since 1949 China's plant breeders have actively collected genetic materials from international centers such as the International Maize and Wheat Improvement Center (CIMMYT), and from other countries, including Mexico, the United States, Canada, Australia, France, the USSR, and Romania. Breeders have also developed their own varieties to meet local requirements—such as early maturing varieties and short straw varieties needed for wheat grown under irrigation that can resist scab and leaf and stripe rust.

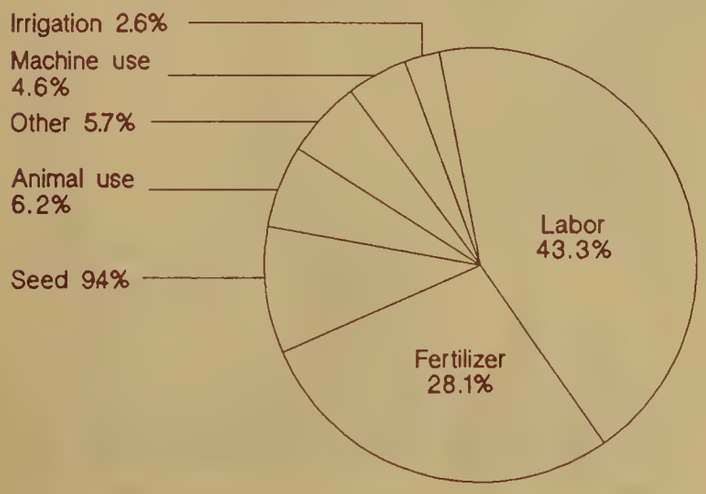
China's low cost wheat producers are located on the North China Plain in Hebei, Henan, and Shandong provinces, and in northwest provinces such as Xinjiang and Ningxia. Farmers in Jilin, Yunnan, and Guizhou provinces lost money trying to raise wheat. Farmers well south of the Yangzi River were high cost producers of wheat (2, pp. 383-384).

Statisticians in the State Statistical Bureau (SSB) have begun to publish cost of production data. In 1986 rural sample survey teams collected data from 1,853 households in 24 of China's 30 provinces, covering 730 ha of wheat. The published data consists of average per mu (1/15 of a hectare) labor and material costs, including those for seed, fertilizer, plant protection, machine cultivation, irrigation and drainage, draft animals, unified agricultural management costs, and other items. China's cost of production data do not seem to include some general farm overhead costs such as taxes, insurance, or interest, and also apparently do not include some of the economic costs included by USDA in computing U.S. costs of production, such as capital replacement and allocated returns to owned inputs (29, p. 43).

Costs of producing U.S. wheat for 1986 were arranged into similar cost categories used by China's statisticians. The cost in each category was divided by total cost per mu (acre) to compute percentage shares of costs. Notwithstanding the limitations inherent in categorizing data in two different economic systems, the major cost patterns are much what one would expect.

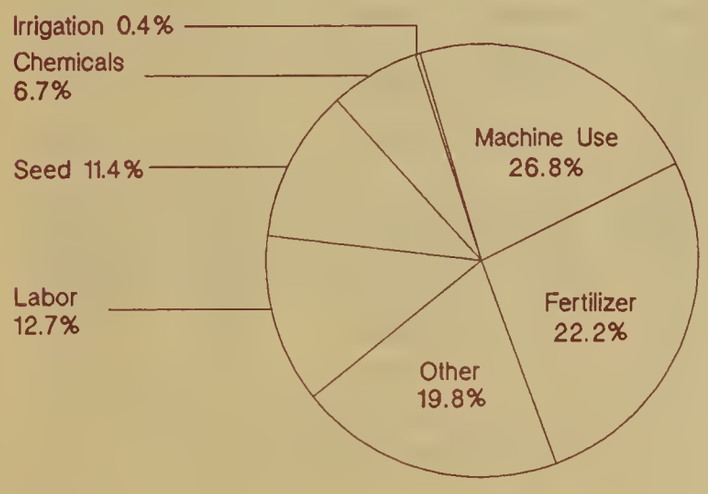
Fig. A-7 shows that labor costs account for over 43 percent of total wheat production costs in China, but only about 13 percent in the United States (fig. A-8). Machine use

Figure A-7
China's Wheat Costs of Production



1986.

Figure A-8
U.S. Wheat Costs of Production



1986.

accounts for nearly 27 percent of costs in the United States, compared with 5 percent in China. In China, animal use costs make up a higher portion of total costs than does machine use. Percentage cost shares for fertilizer and seed are roughly comparable in the two countries.

Production/Yield Prospects

By world standards China's farmers already have achieved fairly high wheat yields—higher than those in India, Pakistan, and countries which raise large areas of dryland wheat, such as Canada, Australia, the USSR, and the United States (table A-1). On the other hand, wheat yields in Mexico, France, Poland, and Japan are higher than those in China.

Given sufficient economic incentives, China's farmers can boost wheat yields still higher with existing physical resources. China's farmers will have difficulties maintaining the supply of irrigation water, and will find expansion of those supplies very costly. However, based on their past experience, greater access to foreign breeding techniques, and supplies of genetic materials, will enable China's plant breeders to develop higher yielding varieties. Also, higher application levels of chemical fertilizers, combined with proper amounts of water and disease control programs, should raise yields (table A-1).

China's experts forecast wheat yields from 1987 to 2000 will climb 1.65 percent per year. They forecast that by the year 2000 wheat area will decrease from the 1987 level of 28.9 million ha to 27-28 million ha, and that annual output will increase to 100-105 million tons (6, 21).

Table A-1--China's wheat yields compared with selected countries

Country	Production conditions	1978	1987
		--kg/hectare--	
China	Mostly irrigated	1.84	3.05
Pakistan	Mostly irrigated	1.32	1.56
India	Mostly irrigated	1.48	1.92
Mexico	Mostly irrigated	3.09	4.11
Japan	Mostly irrigated	3.27	3.19
Australia	Mostly dry fields	1.77	1.34
Argentina	Mostly dry fields	1.73	1.84
USSR	Mostly dry fields	1.92	1.78
Poland	Mostly dry fields	3.26	3.72
France	Mostly dry fields	5.03	5.49
Canada	Mostly dry fields	2.00	1.93
US	Mostly dry fields	2.11	2.53

Source: Agricultural Statistics 1979 and 1988, U.S. Department of Agriculture.

China's International Wheat Trade

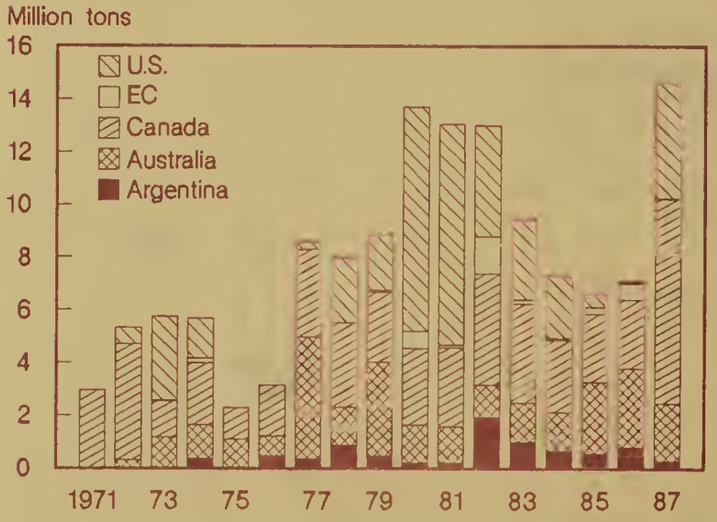
China began this century by both exporting and importing small quantities of wheat and wheat flour. From 1900 to 1921 China exported more wheat and flour than it imported. Beginning in the early 1920's, however, imports exceeded exports, so that by 1935-39, China's annual imports of 705,000 tons of wheat (flour converted to whole wheat equivalent) far surpassed its exports of only 50,000 tons (16, pp. 15 and 20).

Only minor quantities of wheat were exported from 1949 to 1960; indeed, small quantities were exported as late as 1975 (15, p. 48). China became a major importer of wheat as the country emerged from the dislocations of the Great Leap Forward, when millions of people died from malnutrition. From 1960 to 1987 imports averaged 6.9 million tons a year, reaching a record 15 million in 1987 (table A-3).

Canada and Australia have been the major suppliers of wheat to China. Argentina also has been a fairly consistent supplier, providing as much as 15 percent of total imports in some years; but in other years it has not participated in the China wheat market. Since 1972 the United States has been a major supplier, sometimes shipping over 60 percent of total imports, and in other years none at all. The European Community has sporadically participated in the market, shipping nearly 11 percent of the supply in 1982, but only small quantities or none at all in some years (fig. A-9).

With their incomes rising, China's consumers have increased their consumption of wheat and wheat products. Per capita consumption will likely rise steadily to the year 2000. Given the limited potential for expanding cultivated area and the probable slowness of yield improvements, domestic supplies of wheat will not match demand. By 2000 imports will consequently be substantial.

Figure A-9
Country Shares of China's Wheat Imports



Stocks

Wheat stocks are defined as grain carried over from one year to the next. Wheat is planted, harvested, stored, and used during one grain year. Stocks are the quantity of wheat left in bins at the end of the season (marketing year) just before the new crop is harvested. China's Grain Bureau operates on an April-March grain year.

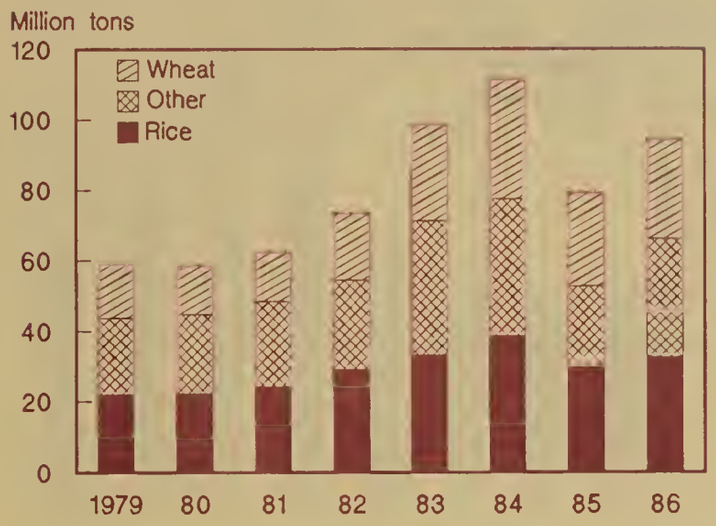
China's authorities have published no information on wheat stocks and very little data on grain stocks in general. Stock numbers obviously have strategic and commercial value, and authorities rarely disclose them. Moreover, interpreting available stock data is often difficult because definitions frequently do not accompany the publication of data.

Since 1955 State wheat and grain stocks have been held at many different administrative levels, at grain purchase stations usually located at township (commune) levels, and at county and prefectural depots (9, p. 35; 26). Cities all have a number of grain depots where stocks are held. Provincial grain officials told USDA analysts in 1986 that it was their aim to have a year's supply of grain stocks on hand for urban residents at all times (9, p. 49). Grain stocks held for urban residents in Hebei and Shaanxi provinces during the mid-1980's more than met the target (9, p. 49; 13).

The wheat stock estimates in table A-3 were derived as part of an overall effort to adjust total grain stocks so that annual changes in per capita grain consumption estimates made by USDA paralleled the consumption estimates of China's grain authorities (7, 8). The second step of the process was to allocate the total grain stock number for each year among the various grains. This task was accomplished by examining stock policies and observing year-to-year changes in specific kinds of grain production. For example, if the SSB consumption numbers suggested stock buildups, and wheat output declined while farmers in the south gathered a bumper rice crop in the appropriate year, then wheat stocks were usually left unchanged while rice stocks were built up.

USDA wheat stock numbers are derived from estimates, and their accuracy depends on judgments to allocate total stocks among the specific grains and on the estimates for seed, feed, and food. If USDA wheat stock estimates seem to be out of line with what little is known about China's grain stocks, then either more research needs to be undertaken to improve these estimates, or further improvements in the series must await the publication of more definitive wheat and grain stock series by the SSB.

Figure A-10
China's Domestic Grain Purchases



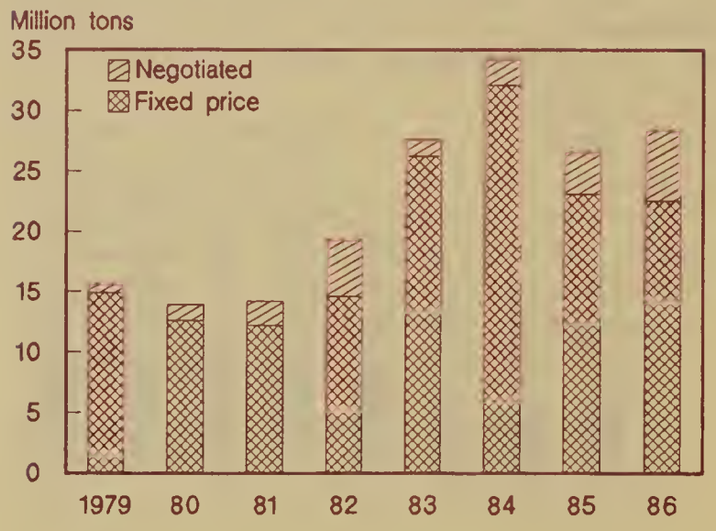
Marketing and Milling

Wheat is a highly prized commodity in rural and urban markets. Government grain buyers seek it out, often purchasing one-quarter to one-third of total wheat output, primarily for transfer to urban areas. In contrast they buy only 15-21 percent of total rice and far less of other grains (12). In 1979-86 wheat made up over 28 percent of all grains purchased by the Government, rice accounted for over 35 percent, and other grains comprised the remaining 37 percent (fig. A-10).

Farmers prefer to consume wheat and are reluctant to part with it. From 1978 to 1986, Government authorities mandated that growers sell at fixed prices 79 to 95 percent of all wheat sold to the State (fig. A-11); farmers sold only 5 to 21 percent of their wheat sales under negotiated prices. Presumably the Government was unwilling to pay sufficiently high prices to coax wheat away from farmers, and instead used the much more extractive fixed price system. In contrast to the unwillingness of wheat farmers, rice farmers were more willing to sell to the Government; 6 to 29 percent of the rice was sold to the Government under negotiated prices.

China's flour milling industry improved after 1949. In rural areas, native stone mills gave way to more modern disk and roller mills. Flour mills in urban areas expanded to handle the increased quantities of wheat the Grain Bureau purchased from rural areas and from foreign countries.

Figure A-11
China's Domestic Wheat Purchases



The urban mills generally produce two kinds of flour: *jingbai*, a white refined flour with an extraction rate of 70 percent (9, p. 39; 15, p. 64), and darker flour with an extraction rate of over 80 percent. The *Agricultural Economic Technical Handbook* suggests the average extraction rate is 85 percent and the highest rate is 91 percent (1, p. 304). A 0.85 extraction rate was used in this article in making flour to wheat conversions.

Demand for Wheat

Feed Use

Wheat is in great demand for food uses, but little is used for feed. National and provincial officials claim that very little wheat is fed to livestock, but say that wheat bran from flour mills is commonly used as a livestock feed (9). In this report, feed use wheat is specified as wheat grain designated for feed use only; byproducts from flour milling are not included in this category. Wheat grain used for feed is estimated to have averaged just over 1 percent of total wheat available for consumption in the early 1960's. This percentage rose to over 2 percent in the mid-1980's as production expanded rapidly. Preferred feedgrains include corn, sorghum, barley, oats, soybeans, and potatoes, but farmers may also feed livestock some wheat, rice, and millet. Where local transportation systems are poorly developed, farmers use some of the preferred food grains as feed because they are unable to ship them out to fetch a higher price, and find it costly to bring in feedgrains. Also, preferred food grains sometimes are used as feed after they have been damaged by insects, rodents, or mildew.

Seed Use

Seeding rates for various growing regions were published in the *Agricultural Technical Handbook* as follows (1, p. 520): Northern winter wheat, 210 kg per ha; Yangzi Valley, wheat 150 kg per ha; South China wheat, 120 kg per ha; and spring wheat, 225 kg per ha.

Sown area data from various provinces for 1983 were placed in the four categories in the handbook (5). Wheat area for each category was multiplied by the appropriate seeding rate. The sum of seed for the four regions totalled 5.562 million tons. This total, divided by total wheat area for 1983 of 29 million ha, yielded 191 kg per ha. Wheat seed use for any given year in table A-3 was calculated by multiplying the area sown to wheat in the subsequent year times 191 kg.

Industrial Use and Waste

There is very little published data on China's industrial wheat uses. Because wheat is in great demand as a preferred food grain, there are no large stocks of the commodity which would motivate stockholders to encourage the use of wheat for industrial purposes. In 1974 the United States used only 0.5 percent of its wheat for industrial purposes (14, p. 36). Small quantities of wheat and flour are estimated to be used in local areas to produce starch (laundries, textiles, pastes), ethyl alcohol, alcohol for human consumption, gluten, and industrial adhesives (14, p. 36; 15, p. 65).

Recent news articles from China suggest about 15 percent of total grain produced each year is lost after the crop is harvested (18, 27). A survey conducted in Zhejiang province found an average of 1 to 3 percent of grain kernels was lost during harvesting; 2 to 4 percent during threshing; 1 to 3 percent on drying floors and road beds; 4 to 8 percent in storage bins; 1 to 2 percent during transportation; and 2 to 5 percent in processing (27). This survey indicates that losses ranged from 11 to 25 percent of total grain output.

Information on industrial use of wheat and wheat losses has been included to help readers understand these elements of wheat use in China. However, there is insufficient data to estimate wheat losses and industrial uses of wheat. It is important to remember that estimates of wheat food consumption include wheat used in industry and loss.

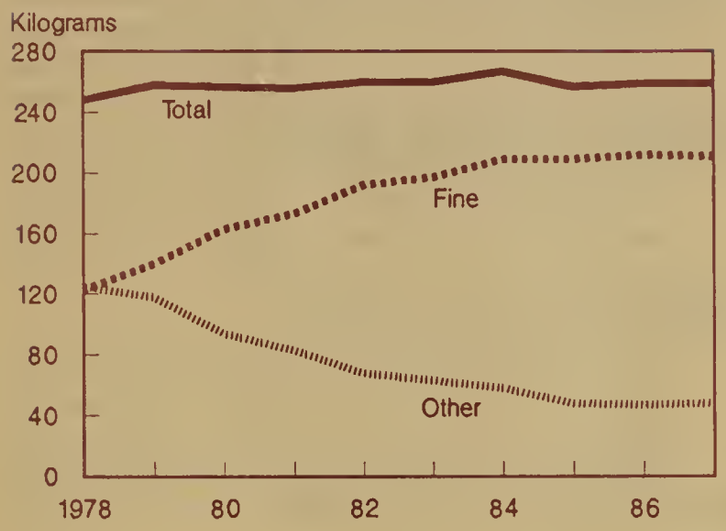
Food Grain Consumption

Per capita wheat consumption has risen dramatically since 1960, when it equaled 29 kg; by 1977, it had risen to 48 kg. During the reform period (1978-1987), per capita wheat consumption soared from 48 to 90 kg.

Rapid increases in grain production since 1978 created a surplus which permitted substantial changes in consumption patterns. The consumption of coarse grains (such as corn, sorghum, barley, oats, and potatoes) decreased substantially, and consumption of fine grains (such as wheat and rice) rose.

Figure A-12

Rural Per Capita Grain Consumption



Rural survey data show that per capita grain consumption rose from 248 kg in 1978 to 259 in 1987 (5, p. 74), a 4.4-percent increase. In the same period, fine grain consumption jumped from 123 to 211 kg per person, a gain of 71 percent. Coarse grain consumption in the same period fell from 125 to 48 kg, a decrease of about 62 percent (fig. A-12).

Between 1981 and 1987, urban consumers reduced their grain consumption by about 8 percent, or from 145 to 132 kg. The change was less dramatic for urban residents because by the early 1980's, fine grains constituted a large percentage of total grains consumed in the cities, and coarse grains only a small percentage.

An axiom in China's rural areas states that "consumers learn to eat and develop special tastes for locally grown grains." In past centuries consumers ate whatever grains were grown in nearby fields because transport systems were underdeveloped, and it was costly or impossible to ship in other kinds of grains. Hence it is not surprising that modern consumption surveys indicate consumers eat considerable quantities of wheat in those provinces where per capita wheat production is high (table A-2).

Most of the wheat supply is milled into flour and used in noodles, steamed dumplings, breads, and pastries. The quantity of wheat noted in the balance sheet (table A-3) as food is derived from total wheat available for consumption, less feed and seed use.

Several provincial examples illustrate the differences between rural and urban grain consumption patterns in wheat and rice producing areas. In table A-2 we see that Shandong

Table A-2--Per capita wheat production and consumption, 1983-84

Province	Per capita wheat production	Rural per capita consumption	Urban per capita consumption
High consumption/ production:		Kilograms	
Xinjiang	201	144	89
Ningxia	183	143	89
Heilongjiang	136	62	75
Henan	192	156	84
Shandong	159	127	62
Beijing	71	129	49
Gansu	168	173	142
Qinghai	158	169	102
Shaanxi	152	130	99
Jiangsu	124	61	15
Low consumption/ production:			
Guangxi	0	1	3
Guangdong	1	1	4
Liaoning	1	18	60
Jiangxi	2	1	4
Fujian	4	1	5
Jilin	6	12	47
Hunan	6	3	6
Shanghai	9	7	2
Guizhou	11	13	17
Zhejiang	22	19	3

Source: (22, p. 233; and 28, p. 157).

province ranks fifth in the nation in per capita wheat production. In 1983 the rural population in Shandong consumed about 223 kg of grain per person: 127 kg of wheat, 3.6 kg of rice, and 92 kg of coarse grains. Urban consumers in Jinan, the provincial capital, consumed 136 kg of grain per person. These urban residents consumed only 43 kg of wheat but nearly 20 kg of rice per person, over 5 times that consumed in rural areas. Furthermore, urban residents in Jinan ate only 1.5 kg of the less preferred coarse grains per capita, while rural residents ate 92 kg.

Although Guangdong province ranks as one of China's least important wheat producers, it is one of the major rice growers. According to income and expenditure surveys, total per capita grain consumption in rural areas in 1983 was 270 kg. Rice constituted more than 95 percent of the grain consumed in rural areas; in contrast, rural residents consumed only 0.7 kg of wheat and 12 kg of coarse grain per person. In Guangzhou (Canton), the provincial capital and a major metropolitan area, residents consumed an average of only 100 kg of grain in 1987, including 67 kg of rice, 1.8 kg of coarse grains, and 1.7 kg of wheat per person. The demand for wheat within the province was greater than the quantity domestically produced, so wheat had to be either shipped in from other provinces or imported.

Table A-3--Wheat supply and use, 1960-87

Year	Production	Beginning stocks	Total imports	Total exports	Total consumption	Feed use	Seed use	Food consumption	Change in stocks	Ending stocks
					1,000 tons					
1960	20960	4000	1949	2	23907	400	4884	18623	-1000	3000
1961	14250	3000	4893	122	20521	250	4598	15673	-1500	1500
1962	16665	1500	4892	89	19268	300	4540	14428	2200	3700
1963	18475	3700	5208	113	23070	500	4853	17717	500	4200
1964	20840	4200	5032	115	26257	550	4719	20988	-500	3700
1965	25220	3700	6282	4	30998	650	4569	25779	500	4200
1966	25280	4200	5025	30	30275	600	4832	24843	0	4200
1967	28485	4200	4156	13	29628	600	4710	24318	3000	7200
1968	27455	7200	3537	1	30991	600	4806	25585	0	7200
1969	27285	7200	5125	1	32909	700	4862	27347	-500	6700
1970	29185	6700	3661	3	32343	700	4897	26746	500	7200
1971	32575	7200	2968	5	33538	700	5024	27814	2000	9200
1972	35985	9200	5290	5	37270	800	5050	31420	4000	13200
1973	35225	13200	5645	5	41365	900	5169	35296	-500	12700
1974	40865	12700	5746	5	41606	900	5283	35423	5000	17700
1975	45310	17700	2200	0	43510	950	5428	37132	4000	21700
1976	50385	21700	3158	0	48543	1100	5360	42083	5000	26700
1977	41075	26700	8600	0	51675	1000	5574	45101	-2000	4700
1978	53840	24700	8047	0	52887	1200	5607	46080	9000	33700
1979	62730	33700	8865	0	66595	1500	5583	59512	5000	38700
1980	55210	38700	13789	0	75999	1600	5407	68992	-7000	31700
1981	59640	31700	13200	0	78840	1700	5337	71803	-6000	25700
1982	68420	25700	13000	0	79420	1700	5549	72171	2000	7700
1983	81390	27700	9600	0	82990	1800	5649	75541	8000	35700
1984	87820	35700	7400	0	92220	2100	5581	84539	3000	38700
1985	85810	38700	6600	0	100410	2300	5659	92451	-9000	30700
1986	90295	30700	8500	0	101795	2400	5526	93869	-3000	27700
1987	87000	27700	11500	0	103500	2500	5654	95346	-5000	22700

Source: (7).

Conclusions

China's wheat supply and use (table A-3) were estimated as part of an overall effort by USDA economists to construct supply and use balance sheets for all of the important grain crops (7, 8). The estimates for wheat in table A-3 were not arrived at in isolation from grain consumption patterns in the rest of China's grain economy; rather, trends in food, feed, and stock use of other grains affected the wheat estimates. Table A-3 summarizes major trends in China's wheat economy over the past 27 years.

Even though it is the world's largest producer of wheat, China's domestic demand exceeds supplies. Wheat output has risen steadily as farmers have boosted yields because of greater irrigation and use of improved varieties. Demand for wheat was intensified by population growth and consumer preference for wheat products.

Human consumption is by far the most important use of wheat in China. Perhaps only 1 to 2 percent of the wheat supply is fed to livestock, and even smaller amounts are used for industrial purposes. Wheat stocks are kept in farm homes for family consumption. Townships and villages keep wheat stocks as reserves for welfare purposes and emergencies, and the Government maintains stocks in towns, cities, and large municipalities to supply the needs of urban residents.

Per capita wheat consumption rose steadily from 29 kg in 1960 to 48 kg in 1978, and then surged to 90 kg in 1987 as supplies increased because of import and production gains.

Since 1960 China has become one of the world's largest wheat importers. U.S. wheat exporters have participated in this trade, supplying as much as 60 percent of total imports in some years, but shipping none in other years.

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Major Agricultural Policy Changes in China in the Last Decade

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Abstract: The major role played by agricultural policy in China in the last 10 years is described. Major policy changes are briefly introduced in four categories: institutional and production, procurement and price, trade, and financial and credit. The impact of each major policy is also summarized. A review of these policies provides an understanding of how China's agricultural sector has evolved, and also indicates that other policies and programs may be needed to foster continued growth in the rural economy.

Keywords: Agricultural policy, institutions, production, marketing, prices, trade.

Agricultural policy has played an important role in the last 10 years in revolutionizing the development of China's agricultural economy. Some policies were implemented to help increase commodity output, but others were instituted to reduce production. Many programs have had a short-run impact on agricultural outturns, and a few may have affected the long-run growth of the country's agricultural development. This article briefly categorizes the major agricultural policy changes of the last decade and summarizes their impact on China's agricultural sector.

China began instituting rural economic reforms in late 1978, contributing to increased fluctuations in agricultural production over the last 10 years. In general, agricultural commodity output grew rapidly and peaked in 1984. Since then, growth of the agricultural sector has slowed significantly, and crop production has stagnated. A review of the important policies of the past decade may help readers understand the evolution of the agricultural sector and suggest other policies or programs that may be needed to foster rural economic growth in coming years.

Major agricultural policy changes that have been implemented since 1978 can be generally classified into the following categories: institutional and production, procurement and price, trade, and finance and credit.

On Institutional and Production Changes

The most obvious changes that have affected rural institutions and production are: the dismantling of the commune system; implementation of the household production responsibility system (HPRS); encouragement of rural industrial development to restructure the rural economy; and experimentation with land use transfer rights. Some major policy changes that have had short-run impacts on China's rural economy are outlined below.

HPRS

The Third Plenary Session of the Eleventh Communist Party of China's Central Committee held in December 1978 decided to give greater autonomy to the household for making economic decisions, allocating the means of production, and retaining surplus output after Government quotas or targets were met. The Government began to phase in the HPRS in early 1980's.

Basically, the HPRS was first instituted as a system of contracting specific jobs (BAOGAN) or responsibilities to commune households in some poor areas, particularly inland areas, or regions specializing in the production of a specific agricultural commodity, such as cotton (11). It was implemented to give households more incentive to increase output and therefore raise income by linking farm returns directly with production.

Because of its initial success in cotton, the HPRS was then extended to oilseed and grain crops. It also spread from poor to rich areas and from inland to coastal regions. By the end of 1984, about 95 percent of rural households were involved in the HPRS.

Many research studies have shown that the system contributed markedly to the gains in agricultural production, especially crop production, in the early years of rural reforms (6). As a result, per capita grain availability rose to a record of about 400 kg by the end of 1984, at least partly due to implementation of HPRS. However, it is also recognized that the initial benefit of the incentive-based system peaked by the mid-1980's (6).

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Dismantling the Commune System

The commune system that began in 1958 consisted of four parts: the commune unit, brigades, production teams, and households. For about 25 years, through the collective production of food and social services, the communes dominated the lives of rural people. However, tight controls, rigid planning mechanisms, inefficient management rules, the absence of any other institutional pattern for rural areas, and low production incentives retarded growth in agricultural output and per capita income.

Instead of trying to alter or improve the system, reformers decided to radically restructure it. The disintegration of the commune system started in 1982 and, by the end of 1984, 95 percent of the communes had been dismantled (1, 3). Nevertheless, a few communes still exist in remote provinces or autonomous regions.

The new system replacing the communes consists of five parts: local revised township governments, local party organizations, State-owned entities, economic cooperatives, and households. The most important difference between the old and the new systems is that the revised township-collective-household system attempts to align government, political, and economic functions with specific institutions rather than have them combined in one entity.

Even more important, households constitute the basic production units and are now motivated by profit. The new system has undoubtedly boosted farmers' incentives, encouraging them to cut costs, take risks, and enter new lines of production. Farmers have responded to these incentives. Since 1979 the value of agricultural production has climbed steadily and the rural economy has become more diversified.

Encouraging Rural Industrial Development

Like many other developing countries, China's economic planners have encouraged rural industries to process and use greater quantities of local raw materials. This policy removed surplus labor from farming and increased farm household income.

There is a saying in rural China, "One can leave the land, but not the village." Development of rural industry has been very successful since reforms began in 1978. In value terms, the gross product of rural industries surpassed that of all agricultural output in 1987. Nonagricultural income, including rural industry, construction, commerce, and transportation, has gone from 7 percent of the net income of rural households in 1978 to 25.4 percent in 1987 (9). These developments also helped transfer more than 80 million farm workers out of crop production and into other activities.

Reports indicate there are 1.5 million nonagricultural enterprises in China. The rapid growth of rural industry, however, has generated a new series of problems. Currently, lack of investment, shortages of energy, scarcity of raw and processed materials, a low level of technical skills, uneven development among regions, poor transportation and communications, a backward rural banking service, and a weak rural educational system diminish prospects for continued strong rural industrial development. In early 1989 the State initiated a campaign to restrain the growth rate of rural enterprises.

Experimenting with Land Use Transfer Rights

In 1986 China began experimenting with sales of land use rights in big cities such as Shanghai, Guangzhou, Shenzhen, Fuzhou, and Xiamen. The most recent statistics indicate these cities have sold the use rights of over 100 pieces of land (4). The major methods for dealing with such land transfers are auctions, tenders, and agreements.

China recognizes rural land as the most important input in farming. China's farm households average only 0.6 hectare (ha) of farm land. Despite implementation of the HPRS in rural areas, farmers have had to deal with unstable land tenure policies and have been unwilling to invest in farmland. A lack of legal definitiveness regarding contracted land use has led to many disputes among rural families.

In addition, changes in the farm labor participation of households in the past few years have created inefficiencies; for example, some families work small pieces of land with a large number of laborers, while others work large pieces with only a few laborers. In Meitan county of Guizhou province, an experiment was carried out to improve the land tenure system. A newly established land bank gives farmers funds for medium- and long-term investment, requiring the land use right as collateral. Farmers who acquire these rights turn over about 40 percent of their production as compensation to farmers who give up the land. Regulations permit this compensation, and the amount is negotiable (9). In some cases, land has been consolidated by bidding. In the long run, this policy could play as critical a role as the HPRS in increasing the productivity and efficient use of land.

On Procurement and Price Changes

Procurement price increases, modification of the unified purchase and supply system, implementation of the household contract system, reduction of contracted purchasing, and elimination of many agricultural commodity procurement prices have deeply affected overall agricultural commodity prices and marketing. These major policies are briefly described below.

Procurement Price Changes

The last 3 decades witnessed three major increases in agricultural commodity procurement prices, particularly in grains and oilseeds. The first adjustment of grain prices occurred in 1961, with a 25-percent jump in procurement prices and no change in Government retail sales prices (9).

The second rise in grain procurement prices, about 17 percent, was implemented in 1966. The two upward adjustments of Government purchasing prices were followed by two consecutive increases in Government retail grain prices in 1965 and 1966. The last major increase in grain procurement prices, approximately 20 percent, took place in 1979, with no change in retail sale prices.

In general, Government retail prices of grain remain at the 1966 level. The price differential between procurement and retail prices has continued to widen because of a series of small increases in various grain procurement prices since 1979.

Adjustments of procurement prices for oilseed crops followed a similar pattern. The latest estimates show that Government subsidies to grain and oilseed producers averaged 17.3 billion yuan for 1979-87, most of which went to consumers.

Government subsidies grew from 8.5 billion yuan in 1979 to 22 billion (excluding a 4-billion subsidy to import agricultural commodities) in 1987; this latter amount accounted for nearly 10 percent of State expenditure (9). In short, the Government now pays producers about 0.4 yuan for each kilogram (kg) of grain sold and roughly 1.0 yuan for each kg of vegetable oil sold. Overall, increases in agricultural commodity prices have stimulated farmers' incentive to produce; but because consumer prices are low, Government expenditures on subsidies have skyrocketed.

Procurement Contract System

This system was first adopted in 1985 to replace the Government's unified purchasing (quota) system. From Western economists' point of view, the replacement represents a big change. However, recent newspaper articles from China and official statements from the Government indicate that the procurement contract system does not differ significantly from the system it replaced. One journalist in China clearly regards contract procurement as both a contract and a quota (5).

In the last few years, the peasants have expressed deep resentment against the "double-track pricing system." In place since 1985, it is intended to smooth the transition from a centrally planned to a market oriented economy. Under the system, the Government purchases some grain, usually at much lower than market prices. The Government also purchases some grain from farmers at negotiated prices and at open market prices. The system prohibits farmers from selling their commodities for much higher free market prices until they have fulfilled their contract quotas.

The system therefore has not played a very positive role. It has, however, simplified the Government's method of purchasing contract grain by using the 30/70 price ratio. The current contract price for grain is made up from prices in the old system—30 percent of the value is given by the value of the old contract price, and 70 percent of the value of the old above quota price. The double-track household contract system has actually impeded the current procurement task. For instance, many farm households reportedly are unwilling to sell grain under the procurement contract system, even when they can acquire some Government input subsidies in exchange (5). More important, farmers have fewer incentives to grow grain, a circumstance that has contributed greatly to fluctuating grain production in the last 4 years.

Reduction of Government Contract Procurement

To help remedy these problems, the Government decided to reduce the amount of grain procured under the contract system. In 1985, the Government procured 74.0 million tons of grains (April-March) under the contract system; in 1986, 1987, and 1988, it reduced its purchases to 61.5, 55.0, and about 50 million tons, respectively (9). Farmers are thus allowed to augment their incomes by selling more of their grain output in open markets.

Government procurement under the contract system is insufficient to meet urban requirements, and the Government must buy more grain (mostly feedgrain) by paying negotiated prices to meet its total annual requirements. This higher priced grain will be largely transferred to urban consumers who buy this grain from the Government.

Elimination of Many Fixed Procurement Prices

The announcement in 1985 of the elimination of fixed procurement and retail prices for fruits, vegetables, livestock products, and other agricultural commodities encouraged farmers to expand production. In the following years, production of fruits and vegetables grew rapidly, and the floating prices allowed growers to generate profits. To a certain extent, continuous production of fruit, vegetables, and other cash crops has cut grain output (10), demonstrating how prices can influence farmers' decisions. In the livestock sector, eliminating fixed procurement and retail prices may have facilitated structural changes. In the mid-1980's, China had ample supplies of feedgrains and managed to significantly increase red meat output, especially pork.

The situation has changed dramatically in the last 2 or 3 years as feedgrain availability has dwindled. However, the flexible price policy enabled the livestock sector to respond

more rapidly than the crop sector to changing market conditions, and it has increased the total supply of meat, poultry, eggs, and dairy products to meet the high demand for animal protein. In contrast, the double-track pricing system prevailing in grain and oilseed production and marketing has retarded farmers' incentives to further develop production of these crops.

On Foreign Agricultural Trade Policy Changes

China's foreign agricultural trade system has relied heavily on central planning. An annual trade plan for agricultural commodities is drawn up by the State Economic Planning Commission, and then carried out by the Ministry of Foreign Economic Relations and Trade. The Ministry of Commerce proposes the grain trade levels. Once promulgated, the plan cannot be altered without the Commission's approval. Since 1987, foreign trade departments have been experimenting with the contract responsibility system, making trade entities responsible for their own financial profits and losses. Currently the Government is using national trade organizations to restrict economic growth by controlling imports and conserving foreign exchange.

The Responsibility System in Foreign Trade

The system is generally based on provincial foreign trade entities. Contracts are signed between central foreign trade corporations and provincial or local trade corporations. The contract includes levels or targets for: total foreign exchange earned from exports; the amount of foreign exchange to be transferred in to the central Government; and the responsibility for accounting and financial profits or losses.

More important, agricultural commodities for export are now categorized into three groups (9). Those in the first group of "vital" commodities (usually closely related to daily life, such as rice, soybeans, and cotton) may be exported only by designated central foreign trade corporations. The second group of "sensitive" commodities (so-called because they have limited international markets, such as rabbit hair), can be exported only by designated provincial or local corporations. The last group of commodities, which includes all remaining commodities, may be exported by any local trade corporations.

Imports related to agriculture have been grouped into three categories in a similar fashion. The first category of "vital" items (including those affecting daily life, such as grains, logs, and fertilizers) may only be imported by central foreign trade corporations. The second category of "sensitive" commodities (so-called because of their limited supply in the international markets, such as wool and wood pulp) can be handled jointly by national and provincial or local foreign trade corporations. The third category of items may be imported by all local trade corporations. Since the implementation of this new policy, China's total trade has reportedly responded positively, with both volume and value of trade increasing markedly in 1988.

On Rural Financial and Credit Changes

In general, reforms of the rural financial and credit system have lagged behind changes in institutions, production, and marketing. The restoration of the Agricultural Bank has greatly enhanced rural financial and credit services.

Restoring Agricultural Banks

The People's Bank of China is the nation's central bank. It obtains financing for exports and imports, and works closely with foreign trade corporations. Before 1979, the banking system was basically controlled by the People's Bank of China. In 1979, the Agricultural Bank of China was restored.

The Agricultural Bank of China is a specialized bank which focuses on the credit needs of rural areas, although it is encouraged to compete with other specialized banks, such as the Construction Bank, the Commercial and Industrial Bank, and the Transportation Bank. For example, in the last 5 years the Agricultural Bank has been allowed to finance projects in urban areas. The bank was given permission 3 years ago to start handling a limited amount of foreign exchange, such as the Hong Kong and U.S. dollars used in coastal provinces.

Over the last few years, the Agricultural Bank has started to offer support for township enterprises. Headquartered in Beijing, the bank has 41 main branches, 40,000 sub-branches, and a staff of 300,000 (9). The bank has a special relationship with Rural Credit Cooperatives (RCC's) located in townships and villages.

Owned by rural investors, RCC's receive some management direction from the Agricultural Bank. The fundamental difference between the Agricultural Bank and the RCC's is that the former offers support to State enterprises and larger scale operations in rural areas, while the latter provide credit for individual farmers and smaller enterprises.

Until 1983, RCC's were controlled by the bank; but under the reforms instituted 6 years ago, RCC boards are now elected by farmers and are supposed to function more autonomously than before. RCC's can make loans if they can get deposits. They are required to place 10 percent of these deposits into a reserve fund with the Agricultural Bank; this fund is then used to support financially troubled RCC's. RCC's also look to the bank to train their officers at their three colleges and municipal training centers. The bank and the RCC's therefore have served as major sources of credit to the rural sector in the last few years.

Conclusions

This article has briefly summarized the major changes in China's agricultural policy over the last decade. In addition to these changes, it is important to note that State agricultural investment has declined continuously, although this decline has been partially offset by increases in investment by local governments and individuals.

The decrease in the central Government investment for capital construction may affect agricultural production, particularly grain output in the medium or long term. A fall in investment such as occurred in 1979-87 could lower growth in agricultural productivity. Individual or private investment is unlikely to make up for the reduction in Government investment without legally established land use transfer rights. Wide adoption of the land use right and more liberalized pricing for agricultural commodities, particularly grain crops, are the key agricultural policy issues affecting long-term agricultural growth.

On the demand side, a distorted pricing system not only poorly allocates scarce resources, but also encourages consumption and waste. Pricing system reforms are a critical issue and will be a major determinant affecting agricultural production, marketing, and trade.

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Agricultural Commodity Policies in China: Estimates of PSE's and CSE's, 1982-87

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Abstract: China's Government intervenes heavily in the production and distribution of major agricultural commodities. In this article producer subsidy equivalents (PSE's) and consumer subsidy equivalents (CSE's) are calculated to measure Government intervention across major agricultural commodities from 1982 to 1987. The results indicate that most agricultural commodities are taxed in China, with rice and peanuts taxed more heavily than other crops. However, this report does not account for other Government support in the agricultural economy, such as transportation, processing, and storage of procured goods. The interpretation of PSE's and CSE's should be subject to this constraint.

Keywords: Intervention, subsidy, border measures, comparative advantage, procurement, ration, efficiency.

Introduction

In China, the production and marketing of agricultural commodities are tightly controlled by the State. Peasants are required to sell a certain proportion of their output to the Government at specified prices. About one-third of grain production is procured by the Government and most of the rest is used by peasants. About 70 to 75 percent of oilseed and meat production is bought by the State. Most cotton, sugar, and honey output is also procured by the Government (3).

The economic reforms started in late 1978 introduced the "production responsibility system" (PRS) to replace the old labor-day work payment system. Individual peasants were given the power to select the product mix and maximize their returns, as long as they fulfilled State procurement contracts. Although the PRS greatly decentralized agricultural production decisions and increased peasants' efficiency, the Government continued to intervene heavily in the production and consumption of agricultural commodities. Market sales of agricultural commodities have been increasing since the economic reforms in 1979, but they are limited to rural areas and Government procurement at negotiated prices. Peasants only sell about 2, 7, and 18 percent of their food grains, oilseed crops, and pork production on the open market (3).

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Agricultural Commodity Policies

China's Government intervenes directly in the production and distribution of major agricultural commodities through: (1) procurement policies and marketing systems; (2) input use policies that are tied to procurement policies; (3) substantial subsidies on agricultural products for urban residents; and (4) border measures to restrain trade of agricultural commodities. The Government also intervenes indirectly in the agricultural sector with infrastructure investments, research, and other supports. Private sector economic activity in a centrally planned economy such as China is limited. It is, therefore, difficult to assess the portion of investment or intervention attributed to each specific commodity.

Procurement and Marketing Policies Prior to the Economic Reforms

Procurement policies and pricing measures are among the most important policy instruments that affect agricultural production. Prior to the 1979 economic reforms, the production and marketing of some agricultural commodities were tightly controlled by the State. For example, the State placed mandatory procurement on farm products that were essential to basic needs and for economic development, such as grains, oilseeds, and cotton. The State procured virtually all sugar and cotton.

Some farm products, such as meat, aquatic products, and tea, which were important for both export commitments and consumption requirements, were controlled by provincial governments. Peasants could sell these products in local markets after the required procurement quotas were fulfilled. Luxury consumer goods, such as vegetables and fruits that were not considered essential to economic development, could be sold in the market. However, because long-distance transportation and marketing were not allowed before 1979, the State was the main and often the sole buyer of these goods. Therefore, the Government effectively set the prices for the last two types of farm products, and there were compulsory procurement quotas on almost all farm products (12).

The State's unified procurement system started in 1953. There were two types of purchases (quota and above-quota) with two sets of prices. Production units were classified as self-sufficient, deficient, or surplus with regard to a specific commodity. Each surplus unit had to sell 80 to 90 percent of the excess commodity to the State after meeting its food, feed, and seed requirements. The State had to purchase whatever surplus the peasants wanted to sell. From 1955 to 1965, prices paid for the above-quota procurement were the same as the quota prices, except in 1960 when the State paid a 10-percent premium for above-quota procurement.

During 1955-65, procurement prices increased only 35 percent. State retail prices for food grains sold to urban residents remained relatively stable, which caused the retail price to be less than the corresponding procurement price.

In 1966, the State created an incentive system to encourage production units to increase output for the State's procurement. First, the quota prices of food grains were raised 17 percent. Second, the Government provided incentives for extra deliveries, combining both in-kind rewards and higher above-quota prices (30 to 50 percent higher than quota prices).

At the same time, the Government raised urban retail prices of all food grains except soybeans (considered a food grain in China) to the procurement price level. Procurement prices of food grains remained unchanged from 1966 to 1978. In contrast, soybean procurement prices increased 9 percent in 1971 and 23.4 percent in 1978. The costs of producing food grains exceeded their procurement prices by more than 7 percent in 1978 (9).

Procurement and Marketing Policies Since the Economic Reforms

With the reforms, the State gradually relaxed the restrictions on what and how much to procure and allowed peasants to sell their surpluses not only to local markets but also to other counties or provinces. To encourage production, especially of grains, the State lowered the quantity procured at the quota price and raised procurement prices a number of times. In 1979, the price of 18 major farm products increased 24.8 percent (1, p. 30). The above-quota price in 1979 was set at 50 percent over the new quota price.

In 1985, the Government abolished compulsory purchasing quotas, and instead negotiated contracts with farmers before they planted their crops. The contracted quantities were purchased at the weighted average of 30 percent of former quota prices and 70 percent of former above-quota prices. The ratio for cotton was 40/60 in the south and 30/70 in the north. The State could procure beyond the contracted amount only at "negotiated" prices on the open market. Peasants are allowed to sell surpluses in open markets after meeting contracted deliveries. The average procurement prices for food grains, oilseeds, and cotton increased by 139, 64, and 62 percent from 1978 to 1987 (2, p. 91). The 1987 average procurement price for all agricultural products was about double the average for 1978.

Intervention in Input Markets

Before reforms were instituted, the Government tightly controlled the labor market. Laborers were not allowed to enter various professions or live in certain locations. There was little private capital and what capital existed could not be shifted. Each piece of land had a specific planned use, and could not be transferred. The mobility of factors of production was thus minimal.

During the reforms, some of the restrictions on input markets were relaxed. The State permitted land use rights to be transferrable in some local areas. As a result, more households specialized in cash crops or livestock production, and farmers could increase their scale of operation. The improved productivity allowed a substantial number of laborers to take up jobs in rural industries or work in construction projects.

The Government often manipulates the allocation of farm resources to secure purchases of farm commodities. For example, the State provides low price fertilizers to farmers who agree to sell to the State, and the Government makes payments in advance. In 1988, the Government offered to sell 12 to 20 kilograms (kg) of fertilizer and 6 kg of diesel oil at reduced prices for every 100 kg of grain or cotton delivered to the State. The State provides low interest agricultural loans to peasants to increase procurement. Also, the State provides subsidized feedgrains to farmers who sell live animals to the Government.

Subsidies for Urban Consumption of Farm Products

Urban residents form a powerful constituency in China's political system. Political leaders are sensitive to urban demands and urban resistance to higher food prices. As a result, the State continues to heavily subsidize the urban consumption of farm products. The Government has significantly increased procurement prices for farm products a number of times, while prices charged urban consumers have remained fairly stable.

The urban subsidies have become an increasingly heavy financial burden to the central Government. In 1986, the State spent about 24.4 billion yuan (about 13 percent of total Government expenditures in 1986) to make up the difference between procurement prices and urban retail prices (4). In addition, the Government spent at least 200 yuan per ton in processing, storing, and transporting food or edible oils from rural to urban areas.

Border Measures

Before 1979, the economy was rigidly centrally planned. The production, marketing, and trade of almost all agricultural products, as well as industrial goods, were tightly controlled by the central Government. What and how much to import and export were regulated by the Ministry of Foreign Trade. Foreign exchange rates were set by the State. Political criteria as well as the principle of comparative advantage were used to guide trade decisions.

Economic efficiency was stressed during the 1979 economic reforms. The State relaxed its regional self-sufficiency policy to allow an increasing number of farmers to specialize in crop and livestock operations. Officials also relaxed some of the restrictions on provincial governments for importing and exporting grain. In the 1980's, Government leaders used imported grains to support households that specialized in cotton or other nongrain production.

Quantifying Government Intervention in China's Agriculture

With the reform, the Government gradually allowed more regional specialization and more autonomous economic decisionmaking. More grain remained in rural areas to support the specialization. Rigid trade restrictions were relaxed to some degree. The Government allowed rural households to specialize in other crops and chose to import more wheat to support urban consumers. However, without measures to quantify the intervention, it is difficult to evaluate the degree of the intervention across major agricultural commodities.

The PSE and CSE measures are estimates of the amount of the cash subsidy or tax needed to compensate farmers and consumers for removing Government intervention. To compare PSE's and CSE's across commodities, the percentage of PSE or CSE to its value of product is used.

Estimates of PSE's and CSE's presented in this article do not account for Government investment in infrastructure, such as irrigation, transportation, or any services that add more value to the commodities. However, this article assumes that Government services were applied proportionately to all agricultural commodities. With this assumption, PSE's and CSE's can be compared across commodities to show the degree of intervention in different agricultural commodities.

Two components of PSE's are estimated in this report: (1) the effect of domestic procurement policy measures, which is the difference between the procurement and market prices; and (2) the effect of border measures, which is the difference between the prices that domestic producers received and alternative prices that they could receive if there were no Government measures to restrain international trade. Estimates for CSE's also contain two parts: (1) budget expenditures in making up price differences; and (2) border measures. The estimates of PSE/CSE are expressed in terms of the percentage of tax or subsidy to its domestic market price.

Estimation of PSE/CSE

The formulas used to calculate these four components of PSE/CSE for each of the major agricultural commodities are expressed as follows:

(1) PSE due to the procurement policy (PSEP)

$PSEP = \{[(P^p - P^m)*Qp]/Q\}/P^m$

P^p: weighted average State procurement price

P^m: domestic market price

Q^p: total State procurement

Q: total quantity produced

(2) PSE due to the border measure (PSEB)

$PSEB = (P^m - P^b)/P^m$

P^b: world reference price

(3) CSE due to the urban rationing policy (CSEU)

$CSEU = (TS/Q - PSEP)/P^m$

TS: total budget expenditure to make up the difference between the procurement price and the State's subsidized resale price.

(4) CSE due to the border measure (CSEB)

$CSEB = (P^m - P^b)/P^m$

Data Requirements and Sources

PSE's and CSE's were estimated for 14 major agricultural commodities from 1982 to 1987. Data on State procurement prices and quantities were obtained from China's State Statistical Bureau (SSB) (2, and 3). The SSB has not published data on the quantity of grains and oilseeds procured by commodity. The procurement mix for grain crops was estimated using a source from the Food and Agriculture Organization of the United Nations (9). The total oilseed procurements are prorated by each crop's corresponding production share.

Since open markets for agricultural commodities are still very limited in China, there is very little published data on market prices. In this study, market prices for grain crops are estimated by using available information on the amount of each crop procured by planned (or contracted) prices and the average procurement prices of the total procurement. The market prices are estimated by the formula, $P^m=(P^p*Q^p - P^c*Q^c)/Q^m$, where P^c is the quota or contracted price, and Q^c is the quantity procured at the quota or contracted price. The market prices for oilseed crops and meat products are estimated using the market price of peasant sales to non-peasants. Since almost all of the cotton, honey, and sugar crops are procured by the State, no attempt is made to estimate their domestic market prices. Instead, domestic market prices of cotton, honey, and sugar are set to equal their procurement prices.

Table C-1--Official exchange rate of RMB/U.S. $, 1979-88

1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
RMB/U.S. $									
1.55	1.50	1.70	1.89	1.98	2.32	2.94	3.45	3.72	3.72

The world reference price for each commodity is based on Hong Kong's imports (i.e., total value imported divided by the total quantity imported into Hong Kong). If Hong Kong prices were not available, prices based on imports to Asia were used. China's currency, the yuan, is denominated as Renminbi (RMB). In this article, official exchange rates were used to convert world reference prices into domestic-valued prices. The shadow exchange rates were often much greater than the official rates, suggesting the yuan was overvalued. For example, the current official exchange rate is now US $1 for 3.72 RMB, but on the open market the rate is $1 for about 7 RMB. The yuan has been devalued continuously since 1980 (table C-1).

Government data on subsidies are very limited. Available data on agricultural subsidies are: (1) the aggregate expenditures making up the difference between procurement prices and Government resale prices to urban residents, and (2) the aggregate expenditures making up the difference between subsidized fertilizer prices and the prices of their imports. A weighing scheme was developed based on the procurement amount and the ratio of market prices to Government resale prices to allocate the total subsidies into individual commodities. In this report, only 1986 price subsidies on inputs were estimated.

Estimates of PSE's/CSE's for Major Agricultural Commodities: 1982-87

Comparisons of PSE's/CSE's Across Commodities, 1986

A negative (positive) PSE indicates a tax (support) on the producers of that commodity. When a PSE is negative due to the procurement policy, it indicates that the procurement price is less than the market price and the price difference more than offsets any input subsidy. Because of procurement policies, all major agricultural commodities have negative signs, suggesting a tax rather than a producer support. In 1986, the taxes for grains, oilseed crops, and eggs, were about 4, 16, and 21 percent of market prices, respectively (table C-2).

The border measure component of PSE's varies widely across commodities. Among grain crops, rice shows the biggest difference between the domestic market price and the world price. Domestic prices of corn, wheat, and soybeans are about the same as their respective world prices, if the official exchange rate is used. Self-sufficiency is still a very important priority. This is reflected in the price ratio of wheat and rice. The procurement price ratio of wheat and rice is just the reverse of the world price ratio. To encourage wheat production, the Government set the price of wheat higher than the price of rice. In the world market, the price of wheat generally is lower than the price of rice. In China, rice farmers are taxed relatively more than any other crop producers.

If there were no border measures or procurement quota requirements, farmers could produce and export rice and corn, but more wheat and soybeans would be imported. Rice is a more labor-intensive crop than wheat. The labor requirement for rice is about 131 work days per acre sown in China, compared with 83 work days for wheat. China should have a comparative advantage in growing rice vis-a-vis wheat.

Further study is needed to link PSE measures with other economic efficiency measures to determine comparative advantage or disadvantage in producing various commodities. Scott Pearson has used a domestic resource cost (DRC) measure to calculate the economic efficiency of producing a product. There is an economic efficiency (advantage) in pro-

Table C-2--PSEs/CSEs for major agricultural commodities in China, 1986

Item	Production	Quantity procured 1/	Procured price 2/	Market price 3/	Reference price/4	Total urban subsidy/5	PSE, procurement/6	PSE, border measure/7	CSE, rationing/8	CSE, border measure/9
	Mil tons	Mil tons	RMB/ton	RMB/ton	RMB/ton	Mil RMB	----------	Percent		---------
Rice	172.22	46.40	371.66	391.96	680.19	4104.29	-5.25	-79.83	11.29	73.53
Wheat	90.04	40.47	462.72	473.70	522.74	4901.49	-2.34	-12.80	12.19	10.35
Corn	70.86	38.18	359.57	375.94	392.09	3267.12	-4.46	-8.86	17.61	4.30
Soybean	11.61	6.00	841.87	867.74	916.85	843.81	-3.01	-8.73	12.31	5.66
Peanuts	5.88	4.26	1054.78	1228.49	1833.44	1024.21	-15.76	-70.62	28.98	49.24
Rapeseed	5.88	4.26	941.97	1097.10	739.09	914.51	-15.76	20.60	28.31	-32.63
Seasame	0.62	0.62	1699.00	1978.80	1548.17	239.09	-16.47	8.88	33.69	-21.76
Pork	17.96	12.11	3034.24	3034.24	5537.35	5229.79	0.00	-82.50	9.77	82.50
Beef	0.59	0.56	5564.81	5564.81	7649.06	447.04	0.00	-37.45	14.26	37.45
Mutton	0.62	0.35	4420.37	4420.37	4870.88	220.00	0.00	-10.19	8.00	10.19
Egg	5.55	2.07	2424.00	3000.00	2898.22	712.74	-20.68	-17.02	23.53	-3.39
Honey	0.17	0.16	2065.00	2065.00	4962.26	62.95	0.00	-140.30	33.35	140.30
Cotton	3.54	3.79	3216.00	3216.00	2655.14	2268.08	0.00	17.44	23.69	-17.44
Sugar	5.25	5.27	610.04	610.04	743.37	597.88	0.00	-21.85	15.89	21.85

1/ Data for total food grain procurement are from (3). Rice and wheat procurement are allocated by the ration from an FAO study (7). Corn and soybeans are prorated by their production share.

2/ Weighted average of contracted and negotiated procurement prices.

3/ Market prices for food grains are estimated State negotiated prices. Market prices for oilseeds are based on peasant sales to non-rural areas. Procurement prices are used for the remaining commodities.

4/ In general, 1986 Hong Kong import prices are used. For commodities that are not significant import goods for Hong Kong, prices are based on the whole Asian region.

5/ The government spent 24.4 billion RMB in 1986 to make up the difference between its procurement and resale prices. The allocation of total price subsidies for each commodity were based on a weighted ratio of market sales to the Government's resale and procurement.

6/ The difference between procured price and market price divided by market price.

7/ The difference between reference price and market price divided by market price.

8/ The sum of urban price subsidy per unit of output and procurement policy PSE divided by market price.

9/ The difference between market price and reference price divided by market price.

ducing this product if the domestic social cost of domestic nontradeable resources (such as land and labor) needed to produce a unit of this product is less than its border price (10).

Urban consumers of agricultural commodities, on the other hand, are protected at the farmers' expense from paying high prices. Urban consumers get a double shield from the Government. First, border measures and transportation difficulties prevent farmers from exporting, forcing them to dispose of their products domestically at lower prices. Second, the Government sells the farm products to urban residents, not only below open market prices, but also substantially below Government procurement prices.

The size of urban subsidies depends on the type of commodity. Staples are subsidized more heavily than nonstaples. In 1986, the estimated domestic market prices for food grains, oilseed crops, and meat were about 83, 57, and 4 percent higher than the corresponding Government retail prices.

Urban subsidized prices appear to have remained quite stable, despite increases in incomes and procurement prices. As the economy continues to expand, resources used on farm production have an increasing number of alternative uses. Thus, the opportunity costs of producing farm products increase. The discrepancy between the prices paid by urban residents and the farm's real costs of production widens and the Government bears this cost.

Table C-3--Estimates of PSEs for major agricultural commodities in China, 1982-87

Item	1987	1986	1985	1984	1983	1982
PSE due to procurement policy:			Percent			
Rice	-5.26	-5.25	-0.89	2.11	-28.26	-19.93
Wheat	-2.35	-2.34	3.43	-1.03	-29.18	-21.63
Corn	-4.59	-4.46	-1.99	1.63	-23.19	-24.54
Soybeans	-1.97	-3.01	-2.58	-2.52	-10.05	-24.54
Peanuts	-17.91	-15.76	-18.00	-29.91	-33.15	-36.67
Rapeseed	-17.77	-15.76	-18.00	-29.91	-33.15	-36.67
Sesame	-19.63	-16.47	-19.12	-33.37	-37.61	-41.02
Pork	0.00	0.00	0.00	0.00	0.00	0.00
Beef	0.00	0.00	0.00	0.00	0.00	0.00
Mutton	0.00	0.00	0.00	0.00	0.00	0.00
Egg	-16.08	-20.68	-26.22	-35.85	-47.87	-45.37
Honey	0.000	0.000	0.000	0.000	0.000	0.000
Cotton	0.000	0.000	0.000	0.000	0.000	0.000
Sugar	0.000	0.000	0.000	0.000	0.000	0.000
PSE due to border policy:						
Rice	-61.74	-79.83	-64.72	-55.67	-55.69	-57.13
Wheat	-17.16	-12.80	-20.03	8.19	2.40	6.81
Corn	4.56	-8.86	-30.27	-26.52	-14.04	-0.23
Soybeans	-9.35	-8.73	-16.93	-32.74	21.65	22.23
Peanuts	-94.67	-70.62	-54.31	-36.50	-28.96	-29.43
Rapeseed	23.87	20.60	0.40	5.46	28.37	27.76
Sesame	20.69	8.88	0.95	13.42	22.82	22.03
Pork	-66.77	-82.50	-44.42	-77.52	-67.43	-64.36
Beef	-45.68	-37.45	-20.59	-36.39	-32.60	-88.61
Mutton	-16.95	-10.19	3.22	-19.48	3.69	-25.99
Egg	-8.29	-17.02	-10.15	-17.90	1.68	-10.30
Honey	-141.63	-140.30	-165.97	-41.05	-7.32	-11.65
Cotton	-3.78	17.44	-4.56	0.09	30.77	30.82
Sugar	-17.75	-21.85	3.96	-11.73	-7.85	-32.97

Table C-4--Estimates of CSEs for major agricultural commodities in China, 1982-87

Item	1987	1986	1985	1984	1983	1982
CSE due to urban rationing policy:			Percent			
Rice	10.72	11.29	8.88	8.15	33.67	26.85
Wheat	11.01	12.19	10.10	17.05	37.02	30.12
Corn	14.61	17.61	14.73	17.18	36.750	35.06
Soybeans	13.02	12.31	15.38	22.03	28.35	35.27
Peanuts	26.85	28.98	33.74	42.17	43.62	47.09
Rapeseed	25.68	28.31	33.31	41.66	42.98	46.51
Sesame	33.69	33.69	41.65	50.47	51.70	53.60
Pork	8.10	9.77	13.95	16.57	16.67	17.44
Beef	10.92	14.26	22.24	25.02	19.38	18.69
Mutton	6.29	8.00	11.43	12.23	10.41	8.78
Egg	19.06	23.53	29.60	37.51	45.94	44.34
Honey	24.87	33.35	22.54	21.68	37.47	39.88
Cotton	20.42	23.69	24.45	21.78	25.39	22.65
Sugar	14.41	15.89	19.38	22.19	21.55	17.41
CSE due to border policy:						
Rice	55.66	73.53	63.69	58.11	25.70	35.62
Wheat	14.64	10.35	23.83	-9.17	-28.19	-26.43
Corn	-8.95	4.30	28.06	28.39	-8.22	-22.23
Soybeans	7.31	5.66	14.21	29.84	-30.21	-42.78
Peanuts	68.22	49.24	32.38	5.50	-3.45	-5.74
Rapeseed	-37.31	-32.63	-16.41	-29.59	-50.72	-51.11
Sesame	-32.70	-21.76	-16.85	-35.09	-43.91	-44.71
Pork	66.77	82.50	44.42	77.52	67.43	64.36
Beef	45.68	37.45	20.59	36.39	32.60	88.61
Mutton	16.95	10.19	-3.22	19.48	-3.69	25.99
Egg	-7.32	-3.39	-14.68	-15.97	-42.37	-29.83
Honey	141.63	140.30	165.97	41.05	7.32	11.65
Cotton	3.78	-17.44	4.56	-0.09	-30.77	-30.82
Sugar	17.75	21.85	-3.96	11.73	7.850	32.97

Comparisons of PSE's/CSE's: 1979-86

Along with the measures adopted to increase peasants' incentives to produce, freedom to make production choices has increased. The State has been increasing procurement at negotiated prices and subsequent sales to urban residents at equivalent market-level retail prices. The amount of food grain procured and sold at negotiated prices increased by more than 6 and 11 times, respectively, between 1979 and 1986 (7).

On a per unit basis, the tax on producers and support to urban consumers and State employees (including the military) has decreased slightly from 1978 to 1987. However, on an aggregate basis, the scope of Government intervention in China's agriculture has been increasing since the economic reforms. In 1987, total procurement of food grains of 141 million metric tons was more than double 1978's 62 million metric tons. The 1979 specified procurement prices were up about 28 percent over 1978 prices. With an increasing proportion of commodities procured at the higher negotiated prices, and with State retail prices to urban residents remaining fairly stable, Government expenditures continued to increase.

China's enthusiasm for economic reforms in the past 10 years has been dampened by rising inflation (18.5 percent in 1988). As a result, the Central Committee decided to increase central control and adopt austerity measures to slow social spending.

Since 1985 grain production has consistently fallen short of targets. Consequently, in early 1989, the Government

decided to make grain production a top priority. In addition to raising procurement prices of food grains and cotton by 18 and 20 percent, respectively, the Government reversed direction and tightened control over the production and distribution of agricultural commodities. The State increased taxes on peasants who produce crops other than grains and cotton. The Government restricted the outflow of rural laborers to urban areas and forced peasants to reserve better land for grain production. The State also placed the exports and imports of grain and cotton back under central control.

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Conversion Equivalents

China	Metric		English
1 mu	0.0667 ha		0.1647 acre
15 mu	1.0 ha2		.4711 acre
1 jin (catty)	0.5 kg =.	0005 ton	1.1023 lbs
1 dan (100 jin)	50.0 kg =.	05 ton	110.23 lbs
1 dun (ton)	1,000.0 kg =	1.00 ton	2,204.6 lbs
1 jin/mu	7.5 kg/ha	6.93 lbs./acre	
Crops:	Lbs/bu.	1.0 bu.	1.0 ton
Wheat, potatoes, soybeans	60	0.02722 ton	36.743 bushels
Rye, corn, and sorghum	56	0.02540 ton	39.368 bushels
Barley	48	0.02177 ton	45.929 bushels
Oats	32	0.01452 ton	68.894 bushels
Cotton (480-lb bale)	NA		4.593 bales
Cotton (500-lb running bale)	NA		1.409 bales

Exchange rate:

In 1988 U.S. $1.00 averaged 3.7221 yuan.

Appendix table 1--China's grain area, yield, and production, 1984-88 1/

Unit	1984	1985	1986	1987	1988
			Million hectares		
Sown area					
Wheat	29.58	29.22	29.62	28.81	28.79
Rice	33.18	32.07	32.27	32.14	31.91
Coarse grains	29.19	26.99	27.91	28.73	27.76
Corn	18.54	17.69	19.12	20.19	19.60
Sorghum	2.45	1.94	1.88	1.86	1.79
Millet	3.80	3.32	2.98	2.69	2.52
Barley	3.77	3.45	3.36	3.40	3.28
Oats	0.64	0.59	0.57	0.58	0.56
Potatoes	8.99	8.57	8.69	8.85	9.07
Others 2/	11.95	11.99	12.45	12.69	12.38
Total 3/	112.88	108.85	110.93	111.22	109.91
			Tons/hectare		
Yield 4/					
Wheat	2.97	2.94	3.04	2.98	3.00
Rice	5.37	5.27	5.34	5.41	5.30
Coarse grains	3.30	3.05	3.12	3.33	3.39
Corn	3.96	3.61	3.71	3.86	3.95
Sorghum	3.15	2.90	2.87	2.93	2.96
Millet	1.85	1.80	1.52	1.86	1.81
Barley	1.94	1.81	1.68	1.92	1.92
Oats	1.21	1.12	1.04	1.18	1.19
Potatoes	3.17	2.98	3.10	3.15	2.97
Others 2/	1.38	1.36	1.36	1.44	1.41
Total 3/	3.61	3.48	3.53	3.62	3.59
			Million tons		
Production					
Wheat	87.82	85.81	90.04	85.90	85.43
Rice	178.26	168.57	172.22	174.26	169.11
Coarse grains	96.22	82.33	87.01	95.89	94.17
Corn	73.41	63.83	70.86	79.24	77.35
Sorghum	7.72	5.61	5.38	5.43	5.30
Millet	7.03	5.98	4.54	4.54	4.55
Barley	7.30	6.24	5.63	6.04	6.30
Oats	0.78	0.66	0.60	0.64	0.67
Potatoes 5/	28.48	26.04	25.34	28.13	26.97
Others 2/	16.54	16.37	16.90	18.30	17.41
Total 3/	407.31	379.11	391.51	402.04	394.08

1/ Data are official figures released by the SSB or the Ministry of Agriculture, except for: (1) 1988 total and individual coarse grain production; and (2) 1984-88 barley and oats, and other grain area and production. 2/ Consists of soybeans, pulses, and other miscellaneous grains. All of these items are included in China's definition of total grains. 3/ PRC definition. 4/ Calculated from area and production figures. 5/ Converted to a grain-equivalent weight using a 5:1 conversion ratio.

Source: China Agricultural Yearbooks, 1984-88; China Statistical Yearbooks, 1987-89; and the 1988 SSB Communique.

Appendix table 2--Grain, soybean, oilseed, cotton, sugar crop, and red meat production, by region and province, 1988

Region/ province	Grain	Soybean	Oilseeds	Cotton	Sugar crops	Red meat
			1,000 tons			
Northeast:						
Heilongjiang	16,430	3,950	130	0	5,551	320
Liaoning	13,072	451	168	6	482	689
Jilin	16,932	986	354	0	1,296	349
North:						
Shandong	30,377	925	1,978	1,137	49	1,500
Hebei	20,225	468	653	577	129	1,085
Beijing	2,346	28	30	3	0	144
Tianjin	1,583	62	35	10	0	70
Henan	26,630	699	962	637	153	956
Shanxi	8,183	266	342	87	511	212
Northwest:						
Shaanxi	9,673	292	246	55	71	353
Gansu	5,933	62	303	5	929	324
Nei Monggol	7,383	476	560	0	2,185	410
Ningxia	1,616	36	54	0	466	49
Xinjiang	6,049	33	386	278	1,101	224
Qinghai	1,058	0	105	0	7	126
East:						
Zhejiang	15,536	123	431	44	829	811
Jiangsu	32,165	641	987	562	293	1,486
Shanghai	2,389	15	191	13	23	180
Anhui	22,964	630	881	206	89	870
Central:						
Hubei	22,594	248	658	362	378	1,236
Hunan	25,199	229	542	44	1,095	1,787
Jiangxi	15,159	147	328	32	1,736	905
South:						
Guangdong	16,568	124	526	0	16,132	1,272
Guangxi	10,450	106	172	0	13,534	739
Fujian	8,186	95	149	0	3,874	562
Hainan	1,198	5	42	0	2,551	114
Southwest:						
Sichuan	37,916	325	1,459	88	2,348	3,771
Guizhou	6,360	130	399	1	219	660
Yunnan	9,402	93	119	0	5,843	646
Xizang	505	0	14	0	0	86
Total	394,081	11,645	13,203	4,149	61,874	21,936

Source: Statistical Yearbook, 1989.

Appendix table 3--China's oilseeds and cotton area, yield, and production, 1984-88

Item	1984	1985	1986	1987	1988 1/
Sown area:			1,000 hectares		
Cotton	6,920	5,140	4,306	4,844	5,535
Oilseeds, USDA 2/	21,056	22,142	21,810	22,464	21,031
Soybeans	7,286	7,716	8,295	8,410	8,021
Oilseeds, PRC 3/	3,678	11,800	11,414	11,180	10,618
Peanuts	2,421	3,318	3,253	3,022	2,977
Rapeseed	3,413	4,494	4,916	5,267	4,936
Sesameseed	858	1,052	1,007	869	704
Sunflowerseed	1,013	1,474	1,040	888	940
Other oilseeds 4/	973	1,462	1,198	1,135	1,140
Yield:			Kg/hectare		
Cotton	900	807	824	876	749
Oilseeds, USDA 2/	1,542	1,426	1,418	1,488	1,360
Cottonseed	1,537	1,373	1,398	1,490	1,277
Soybeans	1,331	1,362	1,400	1,478	1,464
Oilseeds, PRC 3/	1,408	1,338	1,291	1,367	1,243
Peanuts	1,989	2,008	1,808	2,042	1,912
Rapeseed	1,232	1,248	1,196	1,254	1,022
Sesameseed	555	657	614	720	574
Sunflowerseed	1,682	1,175	1,485	1,398	1,426
Other oilseeds 4/	730	746	679	648	526
Production:			1,000 tons		
Cotton 5/	6,258	4,147	3,540	4,245	4,149
Cotton (1,000 bales) 5/	27,900	19,060	16,259	19,497	19,056
Oilseeds, USDA 2/	1,064	31,567	30,941	33,418	30,794
Cottonseed	10,640	7,055	6,020	7,217	7,067
Soybeans	9,700	10,509	11,614	12,430	11,650
Oilseeds, PRC 3/	11,910	15,784	14,738	15,278	13,203
Peanuts	4,815	6,664	5,882	6,171	5,693
Rapeseed	4,205	5,607	5,881	6,605	5,044
Sesameseed	476	691	618	526	404
Sunflowerseeds	1,704	1,732	1,544	1,241	1,340
Other oilseeds 4/	710	1,090	813	735	600
Available oil 6/	3,565	4,282	4,442	4,709	4,156
Available meal 6/	8,610	8,469	8,163	8,052	7,773

1/ Figures for sunflowerseed and other oilseeds are USDA estimates. 2/ Oilseed data published by USDA include only soybeans, cottonseed, peanuts, rapeseed, and sunflowerseed; area includes cotton. 3/ China's total oilseed data exclude soybeans and cottonseed. 4/ "Other oilseeds" are calculated as a residual and include mainly huma (an edible oil-bearing flaxseed) and castor beans; oil-bearing tree seeds are excluded. 5/ Cotton production is on a ginned-weight basis. Bales are 480 pounds. 6/ Available oil and meal are estimated for the marketing year following harvest by applying assumed crush and extraction rates to production plus net imports of soybeans, soybean oil, and soybean meal. Other edible oils from grain crops and oil-bearing tree seeds are included in available oil.

Source: China Statistical Yearbooks, 1985-88; China Agricultural Yearbook, 1982-87; and the 1987 SSB Communique.

Appendix table 4--China's yearend livestock inventories and product output, 1984-88

Item	1984	1985	1986	1987	1/ 1988
			Million head		
Yearend inventory:					
Hogs	306.79	331.40	337.19	327.73	342.22
Large animals	108.39	113.82	118.96	121.91	125.38
Draft animals	64.03	66.46	69.05	71.13	72.19
Cattle	82.13	86.82	91.67	94.65	97.95
Dairy cows	1.34	1.63	1.85	2.16	2.22
Water buffalo	19.51	19.93	20.41	21.50	21.65
Horses	10.98	11.08	10.99	10.69	10.54
Mules	9.96	10.41	10.69	10.84	11.05
Donkeys	4.79	4.97	5.11	5.25	5.37
Camels	0.53	0.53	0.50	0.48	0.47
Sheep	95.19	94.21	99.01	102.65	110.57
Goats	63.21	61.67	67.22	77.69	90.96
Poultry	1,669.63	1,978.91	1,965.60	2,050.00	2,150.00
			Million head		
Number slaughtered:					
Hogs	220.47	238.75	257.22	261.77	275.70
Cattle	3.87	4.57	5.55	6.33	7.30
Sheep & goats	50.81	50.81	52.27	56.52	62.22
			Percent		
Slaughter rate:					
Hogs	73.8	77.8	77.6	77.6	83.9
Cattle	4.7	5.6	6.4	6.9	7.7
Sheep & goats	30.4	32.1	33.5	34.0	34.5
			1,000 tons		
Production:					
Meat	15,406	17,607	19,171	19,860	21,936
Pork	14,447	16,547	17,960	18,349	20,176
Beef	373	467	589	792	958
Mutton	586	593	622	719	802
Poultry meat	1,375	1,602	1,879	2,020	2,200
Cow's milk	2,186	2,499	2,899	3,301	3,660
Sheep & goat's milk	410	395	430	487	529
Sheep's wool	183	178	185	209	222
Mohair	11	11	12	13	14
Cashmere	3	3	4	4	5
Eggs	4,316	5,347	5,550	5,902	6,955

1/ All 1988 data are ERS estimates except for inventory of hogs, large animals, hogs slaughtered, hog slaughter rate, production of meat, cow's milk, and sheep's wool.

Source: China Agricultural Yearbooks, 1984-88; 1989 SSB Communique.

Appendix table 5--China's major agricultural exports by volume, 1985-88

Item	Units	1985	1986	1987	1988
Swine, live	1,000 head	2,960	3,110	3,020	3,027
Poultry, live	1,000 head	34,510	42,450	41,150	44,180
Beef, fresh or frozen	Tons	31,652	25,704	33,587	53,986
Pork, fresh or frozen	Tons	111,060	104,670	99,964	63,484
Broiler, frozen	Tons	12,571	27,971	16,769	25,660
Rabbit meat, frozen	Tons	24,211	13,975	20,545	20,976
Eggs	Million	1,018	1,063	1,109	924
Food grain	1,000 tons	9,330	9,420	7,080	7,180
Rice	1,000 tons	1,010	950	1,020	700
Corn	1,000 tons	6,340	5,640	3,920	3,920
Soybeans	1,000 tons	1,140	1,380	1,710	1,480
Fruit	Tons	214,112	223,859	243,792	280,853
Oranges	Tons	52,308	61,239	76,160	74,705
Apples	Tons	55,188	48,135	60,345	87,859
Walnuts, in shell	Tons	11,844	13,786	9,777	8,370
Walnut meat	Tons	8,212	8,212	11,294	10,608
Chestnuts	Tons	30,991	38,816	35,966	35,292
Sugar	Tons	184,025	265,475	452,493	247,802
Natural honey	Tons	54,790	80,590	66,831	46,487
Tea	Tons	136,787	172,084	174,273	198,290
Canned food	Tons	389,874	445,277	536,958	554,176
Pork	Tons	98,589	88,664	93,757	81,528
Vegetables	Tons	233,768	287,133	329,843	333,224
Fruit	Tons	40,697	47,896	87,351	87,967
Beer	Tons	28,019	28,367	32,429	39,343
Flue-cured tobacco	Tons	17,777	15,387	17,019	19,367
Goatskin	1,000 pieces	17,790	11,264	721	1,145
Furskin, raw	1,000 pieces	4,460	3,473	844	435
Mink skin	1,000 pieces	1,980	685	270	174
Raw silk	Tons	10,893	9,394	9,234	9,404
Cotton	Tons	347,026	563,157	754,577	468,002
Cashmere	Tons	2,069	1,502	2,560	2,712
Rabbit hair	Tons	4,450	3,556	4,908	9,735
Salt	1,000 tons	1,070	1,173	808	382
Oilseeds, edible	Tons	409,604	508,319	528,938	510,215
Peanuts and shelled peanuts	Tons	163,354	262,419	267,987	251,218
Vegetable oil	Tons	161,618	165,723	55,660	25,503
Cotton yarn	Tons	154,728	228,202	242,964	205,717

Sources: China's Customs Statistics, 1986-89.

Appendix table 6--China's major agricultural exports by value, 1985-88

Item	1985	1986	1987	1988 1/
		1,000 Yuan		
Swine, live	524,710	677,010	752,410	867,476
Poultry, live	163,250	242,410	267,290	284,886
Beef, fresh or frozen	134,810	142,860	210,170	401,918
Pork, fresh or frozen	490,200	629,950	644,780	431,140
Broilers, frozen	46,070	134,130	93,920	187,015
Rabbit meat, frozen	96,260	91,080	153,570	139,169
Eggs	106,670	125,610	159,630	153,090
Food grain	4,050,710	4,525,440	3,677,780	4,425,800
Rice	673,510	659,130	700,890	673,626
Corn	2,223,280	2,109,170	1,202,610	1,464,572
Soy	780,640	1,021,650	1,384,170	1,418,008
Fruit	239,270	314,040	377,210	467,905
Oranges	70,080	98,190	135,070	142,556
Apples	59,360	67,659	96,200	146,688
Walnuts, in shell	27,890	45,920	36,250	30,745
Walnut meat	46,370	49,500	92,210	87,507
Chestnuts	130,320	242,970	242,940	228,611
Sugar	89,680	188,490	337,110	230,919
Natural honey	115,840	219,950	200,240	137,792
Tea	891,440	1,150,680	1,354,960	1,496,173
Canned food	1,186,830	1,544,740	2,000,050	2,416,238
Pork	423,620	497,030	582,430	534,047
Vegetable	606,080	816,990	1,053,500	1,314,236
Fruit	82,900	123,110	224,050	218,599
Beer	26,950	38,130	50,570	76,824
Flue-cured tobacco	92,230	97,060	133,310	1,543,927
Goatskin	174,370	172,340	127,820	157,445
Furskin, raw	149,640	79,429	173,820	192,060
Mink skin	117,590	130,300	131,590	141,142
Raw silk	755,110	827,620	867,360	1,148,938
Cotton	1,286,250	1,784,430	2,831,720	2,675,632
Cashmere	258,010	255,010	475,530	709,469
Rabbit hair	518,310	265,123	582,190	857,535
Salt	58,020	81,550	92,350	54,119
Oilseeds, edible	584,650	840,920	1,016,980	968,714
Peanuts and shelled peanuts	322,130	530,240	683,400	633,576
Vegetable oil	331,370	303,390	115,120	64,653
Cotton yarn	874,690	1,478,390	1,993,170	1,904,859

1/ 1988 values are converted from U.S. dollars by using exchange rate of 3.7221.

Source: China's Customs Statistics, 1986-89.

Appendix table 7--China's major agricultural imports by volume, 1985-88

Item	Units	1985	1986	1987	1988
Food grain	1,000 tons	5,970	7,320	16,170	15,330
Wheat	1,000 tons	5,380	5,310	13,200	14,550
Barley	1,000 tons	30	420	210	80
Corn (maize)	1,000 tons	90	330	1,540	110
Dried beans	1,000 tons	40	50	40	30
Soybeans	1,000 tons	0	190	280	150
Sugar	Tons	1,908,721	1,182,491	1,826,814	3,708,940
Coffee & coffee extracts	Tons	518	1,832	1,564	2,849
Cocoa beans	Tons	6,324	27,165	14,474	16,777
Natural rubber	Tons	163,313	211,029	214,995	362,150
Synthetic rubber	Tons	72,404	83,751	40,405	40,974
Logs	1,000 tons	9,710	5,729	5,620	na
	10,000 cubic meters	na	na	609	932
Cotton	Tons	163	187	5,976	34,773
Jute & hemp	Tons	2,500	41,023	21,718	750
Wool	Tons	113,375	152,205	152,503	187,377
Animal oil & fats	Tons	66,641	74,165	111,503	119,839
Edible vegetable oil	Tons	34,777	197,980	521,428	213,721
Other vegetable oil	Tons	109,540	272,154	328,283	480,135
Oilseeds (other than soybeans)	Tons	1,101	2,597	685	1,443
Fertilizer, manufactured	Tons	7,609,396	5,282,933	10,897,287	14,706,323
Ammonia sulphate	Tons	50,607	123,588	48,012	78,507
Urea	Tons	3,822,137	2,993,056	5,566,830	8,492,246
Agricultural agent (chemicals)	Tons	16,138	7,498	10,062	34,142

na = Not available.

Source: China's Customs Statistics, 1986-89.

Appendix table 8--China's major agricultural imports by value, 1985-88

Item	1985	1986	1987	1988 1/
		1,000 Yuan		
Food grain	2,896,420	3,666,750	6,534,910	7,055,389
Wheat	2,571,710	2,800,660	5,077,100	6,443,104
Barley	11,940	66,640	78,780	32,159
Corn (maize)	363,500	227,350	560,390	44,889
Dried beans	49,620	76,340	40,760	44,591
Soybeans	620	215,370	227,900	138,015
Sugar	828,190	772,790	1,107,120	3,194,455
Coffee/coffee extracts	8,600	29,210	47,850	65,323
Cocoa beans	48,860	252,750	145,180	129,827
Natural rubber	385,070	573,230	1,215,890	1,596,930
Synthetic rubber	240,380	246,220	189,620	220,311
Logs	2,406,410	2,103,830	1,576,210	na
	na	na	na	3,348,997
Cotton	390	540	47,600	219,046
Jute & hemp	5,090	50,900	25,350	1,191
Wool	1,022,220	1,708,280	2,021,570	3,333,289
Animal oil & fats	100,680	72,700	151,430	187,482
Edible vegetable oils	65,510	290,350	700,730	352,930
Other vegetable oils	198,080	254,539	475,490	849,979
Oilseeds (other than soybeans)	2,090	3,570	1,230	2,605
Fertilizer (mnfctd)	4,347,890	2,523,990	5,222,130	8,692,927
Ammonia sulphate	15,130	30	12,110	25,757
Urea	2,116,137	1,239,060	2,187,610	4,534,076
Agricultural agent (chemicals)	295,860	138,440	205,130	581,653

1/ 1988 values are converted from U.S dollars by using 3.7221 exchange rate.

Source: China's Customs Statistics, 1986-89.

Appendix table 9--U.S. agricultural exports to China, 1986-88 1/

Item	Fiscal years			Calendar years		
	1986	1987	1988	1986	1987	1988
			1,000 tons			
Wheat	144	898	5,826	0	1,916	6,592
Corn	0	1,090	217	56	1,251	0
Tobacco	2,550	125	0	--	0	1
Cattle hides, whole 2/	428	159	127	278	208	130
Soybeans	187	250	179	124	429	0
Cotton	0	1	--	--	--	20
Soybean oil	0	0	0	0	0	0
			US $ 1,000			
Wheat	18,777	64,743	524,046	0	139,202	697,838
Corn	0	81,565	17,604	4,241	94,926	0
Tobacco	737	0	0	737	0	3,671
Cattle hides, whole	16,867	7,591	6,786	11,123	10,612	6,214
Soybeans	37,971	50,036	35,859	25,407	85,895	0
Cotton	0	726	1,328	283	248	25,181
Soybean oil	0	0	0	0	0	0
Others	13,239	30,169	27,367	15,663	32,001	26,084
			US $ million			
Total agricultural	87	235	613	57	362	759
Total nonagricultural	3,467	2,792	4,129	3,019	3,106	4,251
Total	3,554	3,027	4,742	3,077	3,469	5,010

-- = Negligible amounts.

1/ U.S. domestic exports, f.a.s.-value basis. Exports include transshipments of agricultural products through Canada. 2/ Numbers in thousands.

Source: U.S. Bureau of the Census, "U.S. Agricultural Exports," country by commodity, monthly printouts; U.S. Department of Agriculture, Economic Research Service, U.S. Foreign Agricultural Trade Statistical Report, various issues.

Appendix table 10--Major U.S. agricultural imports from China, by calendar year, 1984-88 1/

Item	1984	1985	1986	1987	1988
			US $ 1,000		
Meats and products, excluding poultry	1,027	687	24	1,300	380
Other meats, fresh or frozen	1,020	650	23	1,280	355
Poultry and products	12,358	15,746	23,265	35,513	31,729
Eggs	1,003	813	1,143	1,206	1,112
Feathers and down, crude	11,355	14,933	22,122	34,303	30,607
Hides and skins	927	1,080	909	923	3,625
Furskins	875	690	228	780	1,960
Wool, unmanufactured, apparel grades	4,020	3,786	2,101	3,615	4,621
Sausage casings	2,076	1,191	1,971	2,391	6,280
Silk, raw	4,518	3,433	3,060	4,259	4,744
All other animal products	16,418	16,292	19,528	23,658	na
Grains and feeds	4,461	4,743	4,037	4,987	5,097
Fruits and preparations	5,466	4,069	4,358	7,415	10,186
Fruits, prepared or preserved	5,461	4,060	4,355	7,410	10,169
Nuts and preparations	8,207	7,783	7,169	7,352	na
Vegetables and preparations	57,824	56,524	53,081	68,800	83,366
Vegetables, prepared or preserved	57,197	56,152	52,125	67,043	81,377
Mushrooms, canned	37,947	37,553	31,037	41,446	48,522
Waterchestnuts	10,795	12,197	13,369	16,393	17,082
Sugar and related products	5,278	7,070	11,622	6,298	6,166
Spices	7,906	8,905	7,843	7,902	6,048
Beverages	30,912	42,014	39,704	35,749	44,658
Coffee and products	0	433	452	404	153
Cocoa and products	8,701	15,243	10,294	6,286	13,994
Tea	18,279	18,269	16,469	14,215	20,169
Malt beverages	2,876	3,508	5,814	6,895	8,821
Oilseeds and products	4,661	2,657	3,687	4,172	6,884
Oilseeds and oilnuts	1,912	1,344	1,193	1,004	1,268
Oils and waxes, vegetable	2,749	1,311	2,494	3,168	4,112
Seeds, field and garden	1,288	1,307	1,579	2,974	3,555
Essential oils	12,943	13,309	13,376	13,754	19,321
Drugs, crude natural	6,282	6,377	4,637	7,343	8,522
All other vegetable products	4,403	3,467	3,874	9,218	10,967
Total agricultural commodities	190,960	197,192	204,278	237,463	279,531
Total nonagricultural commodities	2,873,846	3,666,208	4,467,222	5,957,837	8,133,369
Total imports	3,064,806	3,863,400	4,671,500	6,195,300	8,412,900

na = Not available.
1/ Imports for consumption, customs-value basis.

Source: U.S. Department of Commerce, Bureau of the Census, "U.S. Agricultural Imports," country by commodity, annual printouts; U.S. Department of Agriculture, Economic Research Service, U.S. Foreign Agricultural Trade Statistical Report, various issues.

Appendix table 11--China's grain trade by country and calendar year, 1983-88

Item	1983	1984	1985	1986	1987	1988
			1,000 tons			
Net grain trade:	12,901	7,818	-1,658	50	11,028	10,268
Total exports	692	2,182	7,717	7,442	5,206	5,094
Total imports	13,593	10,000	6,059	7,492	16,234	15,362
Total wheat imports:	11,339	9,607	5,626	6,383	13,942	14,872
Argentina	2,996	1	875	393	810	na
Australia	416	2,325	1,241	2,619	4,504	na
Canada	4,659	3,187	2,370	2,659	5,968	na
EC	860	27	324	145	725	na
United States	2,458	4,067	816	228	1,566	na
Japan	na	na	na	137	180	na
Wheat imports:	11,339	9,607	5,626	6,114	13,200	14,550
Argentina	2,946	1	875	534	810	304
Australia	416	2,325	1,214	2,616	4,432	397
Canada	4,659	3,187	2,370	2,538	5,699	7,532
EC	860	27	324	145	566	30
United States	2,458	4,067	816	226	1,564	5,768
Flour imports:	na	na	na	167	461	102
Argentina	na	na	na	0	0	0
Australia	na	na	na	2	45	0
Canada	na	na	na	75	167	33
EC	na	na	na	0	99	na
United States	na	na	na	1	1	3
Japan	na	na	na	85	112	57
Rice imports:	na	na	na	322	541	310
Australia	na	na	na	0	70	69
Burma	na	na	na	72	92	0
Korea, DPR	na	na	na	20	25	0
Thailand	na	na	na	230	316	253
United States	na	na	na	0	33	55
Coarse grain imports:	2,093	147	120	787	1,752	190
Argentina	50	0	5	30	143	0
Australia	0	75	65	42	95	30
Canada	83	26	0	157	94	52
EC	24	0	0	0	0	0
Thailand	161	34	67	509	169	0
United States	1,357	0	0	32	1,239	107
Corn imports:	1,986	46	80	588	1,541	109
Argentina	na	na	na	30	143	0
Australia	na	na	na	0	0	0
Canada	na	na	na	0	0	0
EC	na	na	na	0	0	0
Thailand	na	na	na	509	169	0
United States	na	na	na	32	1,228	107
Barley imports:	107	101	40	199	211	81
Australia	na	na	na	42	95	30
Canada	na	na	na	157	94	52
EC	na	na	na	0	0	0
United States	na	na	na	1	11	0

See footnotes at end of table.

Appendix table 11--China's grain trade by country and calendar year, 1983-88--continued

Item	1983	1984	1985	1986	1987	1988
			1,000 tons			
Total grain exports	692	2,182	7,717	7,442	5,206	5,094
Rice exports:	580	1,160	1,019	950	1,022	698
Hong Kong	na	0	0	0	54	106
Iran	na	175	150	124	175	0
Macau	na	0	0	0	47	11
Sri Lanka	na	12	[illegible]	[illegible]	11	92
United Arab Emirates	na	[illegible]	[illegible]	[illegible]	10	6
Democratic Yemen	na	11	9	12	7	31
Benin	na	0	0	22	0	2
Angola	na	0	0	0	17	0
Guinea	na	0	0	21	0	19
Ivory Coast	na	77	0	81	109	0
Libya	na	20	30	41	31	20
Mauritius	na	39	37	50	51	54
France	na	219	46	11	0	0
Bulgaria	na	0	10	10	21	0
Czechoslovakia	na	50	50	41	41	30
German, DR	na	18	20	30	24	20
Poland	na	33	70	60	75	60
Romania	na	34	30	30	50	21
Switzerland	na	128	162	0	32	24
Brazil	na	0	3	70	0	0
Cuba	na	33	50	100	101	50
Peru	na	0	0	49	93	0
Coarse grain exports	112	1,022	6,698	6,492	4,184	4,396
Corn exports:	61	911	6,340	5,640	3,916	3,912
Korea, DPR	na	na	123	127	89	165
Hong Kong	na	na	1,046	761	218	238
Japan	na	na	2,461	2,709	1,600	1,504
Malaysia	na	na	14	0	20	144
Philippines	na	na	130	177	61	0
Singapore	na	na	289	16	42	172
German, FR	na	na	14	0	15	0
German, DR	na	na	0	85	21	98
Poland	na	na	0	104	104	0
USSR	na	na	1,605	1,603	1,720	1,447
Mexico	na	na	0	41	24	0
Other grain exports:	51	111	358	852	268	484
Hong Kong	na	na	na	140	44	105
Japan	na	na	na	540	194	294
Singapore	na	na	na	119	16	40

na = Not available.

Source: Data for 1986-88 comes from China's Customs Administration, Summary Surveys of China's Customs Statistics, Beijing, 1986-88. Data for 1983-85 came from Almanac of China's Foreign Economic Relations and Trade, 1984-86.

Appendix table 12--China's trade in other agricultural commodities by country, 1986-88

Item	1986	1987	1988
		Tons	
Imports:			
Cotton	186	5,976	34,773
Pakistan	0	1,948	20,166
Egypt	0	3,822	1,986
Sudan	0	200	5,113
United States	0	1	940
Sugar	1,114,232	1,760,277	3,351,393
Australia	423,101	408,682	425,750
Cuba	392,779	396,415	1,350,261
Thailand	242,700	678,375	799,242
United States	0	177,164	0
Philippines	0	15,900	0
Exports:			
Cotton	558,089	754,576	468,002
Hong Kong	157,822	189,551	61.353
Indonesia	51,607	57,311	42,740
Japan	103,171	183,194	142,894
USSR	43,714	43,862	7,322
Thailand	17,747	36,434	14,381
E. Europe	73,549	83,424	72,626
Soybeans	1,368,205	1,710,141	1,477,324
Hong Kong	9,108	16,107	39,425
Indonesia	260,413	273,785	308,252
Japan	343,410	296,833	299,484
Malaysia	150,308	126,446	120,799
Singapore	19,916	31,731	57,393
USSR	448,506	816,343	509,762
E. Europe	53,900	28,446	33,920

Source: China's Customs Statistics, 1986-88.

Map of China


SOVIET UNION
Lake Baikal
Lake Balkhash
MONGOLIA
HEILONGJIANG
Harbin
Chengchun
JILIN
Urumqi
NEI MONGOL
Shenyang
LIAONING
NORTH KOREA
XINJIANG
AFG.
PAK.
Indian claim
Cease-Fire Line
Chinese line of control
GANSU
Huang He
Hohhot
BEIJING
Beijing
Demarcation Line
SOUTH KOREA
Yinchuan
Shijiazhuang
HEBEI
Taiyuan
NINGXIA
SHANXI
Jinan
SHANDONG
Yellow Sea
Xining
QINGHAI
Lanzhou
Xi'an
SHAANXI
Zhengzhou
HENAN
JIANGSU
Nanjing
Hefei
ANHUI
Shanghai
XIZANG
SICHUAN
Chengdu
Chang Jiang
HUBEI
Wuhan
East China Sea
NEPAL
Lhesa
BHUTAN
INDIA
Ganges
Brahmaputra
BANGLADESH
Hangzhou
ZHEJIANG
Chengsha
Nanchang
JIANGXI
HUNAN
Guiyang
GUIZHOU
FUJIAN
Taiwan
Kunming
YUNNAN
GUANGXI
GUANGDONG
Guangzhou
Xi Jiang
HONG KONG
MACAU (PORT.)
BURMA
Nenning
LAOS
VIETNAM
Hainan Dao
South China Sea
PHILIPPINES
THAILAND
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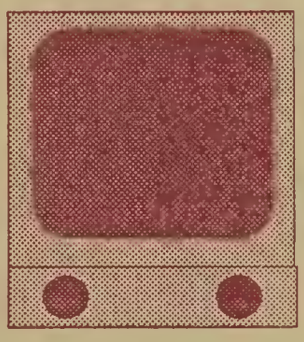

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